Investigating non-regulatory barriers and incentives to stakeholder participation in reducing water pollution in Pietermaritzburg's Baynespruit

by

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Abstract

The Baynespruit, a stream running through the city of Pietermaritzburg in KwaZulu-Natal, is blighted by chronic, severe solid and liquid waste pollution in the form of sewage, industrial effluent and household garbage. It drains a large residential area, then flows through the city's main industrial area before reaching a low-income neighbourhood whose residents are unable to use the water for recreation and small-scale agricultural irrigation due to its polluted state. Both the Department of Water Affairs and Forestry (DWAF) and the local Msunduzi Municipality have been largely unsuccessful in their attempts to use regulatory means to address the situation over the past two decades. Bodies such as the Msunduzi Catchment Management Forum (MCMF) have little representation from industry and have been equally unable to initiate effective action. One possible way to work toward reducing pollution problems is to involve all stakeholders in a co-operative participatory process; a key element is therefore the use of incentives and the removal of barriers to participation.

The aim of this research was to analyse past initiatives that have tried to address pollution in the Baynespruit, gain an understanding of stakeholders' views of the problems and their relative importance, and identify economic, situational, developmental and socio-cultural barriers and incentives to participation in a multi-stakeholder process. To accomplish this, the research methodology included a number of different qualitative techniques as part of a case study approach. The main research tool used was a semi-structured interview conducted with individual stakeholders from government agencies and parastatals, industry, local residents and members of NGOs; the use of historical print media coverage and both participant and direct observation complemented the interview data.

Though the details of past initiatives were difficult to trace due to the loss of institutional memory at both the agency and NGO level, they appear to have suffered from a lack of communication, accountability and inclusiveness among key stakeholders. Most of the stakeholders interviewed have an understanding of the various pollution problems affecting the Baynespruit and the consequent threat to human health, and there was general agreement that a mix of education, monitoring and enforcement was necessary to solve these problems. There was also broad support for a multi-stakeholder process, with all subjects stressing the need for action, not just discussion, as well as real engagement on the part of their fellow stakeholders. For local residents, building a network of contacts and partnerships could address many of the economic, developmental and socio-cultural barriers they face, and strengthen their effectiveness in fostering participation among other stakeholders. While barriers to industry participation in pollution reduction included problems

such as a lack of consequences for polluting, and the feeling that it was ‘not their problem’, powerful economic and situational incentives, such as pressure from corporate customers and the public, remain largely unexploited. A lack of resources in the form of time, staff and equipment, as well as unsuccessful past experiences which have created a reluctance to prosecute or release information, were the major impediments preventing staff at regulatory agencies and parastatals from motivating other stakeholders to participate, though they were aware of the potential for increase effectiveness offered by participatory processes. It is hoped that by recommending ways to maximise incentives and reduce barriers, this research will assist the recently-established Baynespruit Conservancy, which is involving all interested parties in an effort to address the serious pollution problems in the stream.

Declaration

I hereby declare that the work contained in this dissertation is my original work conducted at the Centre for Environment, Agriculture and Development, Faculty of Science and Agriculture, University of KwaZulu-Natal, under the supervision of Dr. Mark Dent. The work of other authors used in this study has been referenced as such. This work has not been submitted for any other degree.

Signature of student Date

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Dr. Mark Dent

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List of Abbreviations

BBBEE	Broad-Based Black Economic Empowerment
BTT	Baynespruit Task Team
CEM	Community Environmental Monitoring
CMA	Catchment Management Agency
CR	Corporate responsibility
DUCT	Duzi-uMngeni Conservation Trust
DWA	Department of Water Affairs (precursor to DWAF)
DWAF	Department of Water Affairs and Forestry
INR	Institute for Natural Resources
KPCA	Keep Pietermaritzburg Clean Association
MCMF	Msunduzi Catchment Management Forum
NEMA	National Environmental Management Act
NGO	Non-government organization
NWA	National Water Act
PCCI	Pietermaritzburg Chamber of Commerce and Industry
SEAF	Sobantu Environmental and Agricultural Forum
SEDN96	Sobantu Environmental Desk Network 96
VEA	Voluntary Environmental Agreement
WIA	Willowton Industrial Area (Pietermaritzburg)

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Chapter 1: Introduction and Overview

1.1 Introduction

> *"The Bayne's Spruit is all but dead. Industrial effluent … and human sewage regularly discharged into the stream … has killed off nearly all the life and oxygen there is. Experts have described the small tributary of the Umsunduzi River as 'an open sewer'."*
>
> (Quinlan, 1993: 1)

In the 15 years since these words were written, not much has changed for the Baynespruit, a stream running through the city of Pietermaritzburg in South Africa. The capital of KwaZulu-Natal province, Pietermaritzburg, shown in Figure 1.1, is nestled among the rolling hills of the Natal Midlands, an area known for its beautiful scenery. The city is part of the larger Msunduzi Municipality, which includes the rural, tribal authority, and former township areas that surround the urban and suburban core. The Municipality is named for the uMsunduzi river, which flows east through Pietermaritzburg on its way to the Indian Ocean. Water quality in the river is acceptable or better until it reaches the urban periphery, but becomes seriously degraded as it flows through the city (Umgeni Water, n.d). As it continues to the eastern edge of Pietermaritzburg, the river is joined by the Baynespruit, a tributary that surely contributes to the poor state of the uMsunduzi. According to the results of weekly monitoring by Umgeni Water, the regional bulk water supplier, the Baynespruit is the most polluted stream in the uMsunduzi Catchment. The factors contributing to its appalling state are far from unique, though, which makes it a worthy case study for stakeholders participation in pollution reduction.

The Baynespruit originates in the Northdale and Raisethorpe neighbourhoods, flowing through the Willowton Industrial Area (WIA) and past small informal settlements and the Eastwood and Sobantu neighbourhoods before reaching its confluence with the uMsunduzi river. It is blighted by chronic, severe solid and liquid waste pollution, and its banks are clogged with invasive alien plants. Raw sewage flows into the stream as a result of sewer surcharges, where due to heavy rain events or blockages the sewer pipes which run along the stream overflow into the water course through breaks or manhole covers; this is exacerbated by illegal rainwater run-off connections to the sewers from housing upstream. Informal settlements, in which residents have no toilet facilities and often use the stream banks, also contribute to faecal pollution. Since 1990, *E. coli* levels in the Baynespruit have been above 5 000 counts per 100 ml more than 70% of the time, and have been recorded above 1 million per 100 ml on a number of occasions (Umgeni Water, 2008); for comparison,

the maximum safe level of *E. coli* for swimming is a mere 130 counts per 100 ml (DWAF, 1996). Discharges of industrial effluent have resulted in fish kills, as well as blockages in the irrigation systems that some farmers in Sobantu use to water their vegetable gardens (Umgeni Water, 2002). Consequently, the stream also has very poor ecosystem health ratings, with a median South African Scoring System (SASS) score below 3, considered 'severely impacted' (Terry, 2008). In the most visible sign of pollution, household garbage tossed onto the floodplain or directly into the water from nearby residences chokes the Baynespruit, especially where it flows under bridges near the community of Sobantu.

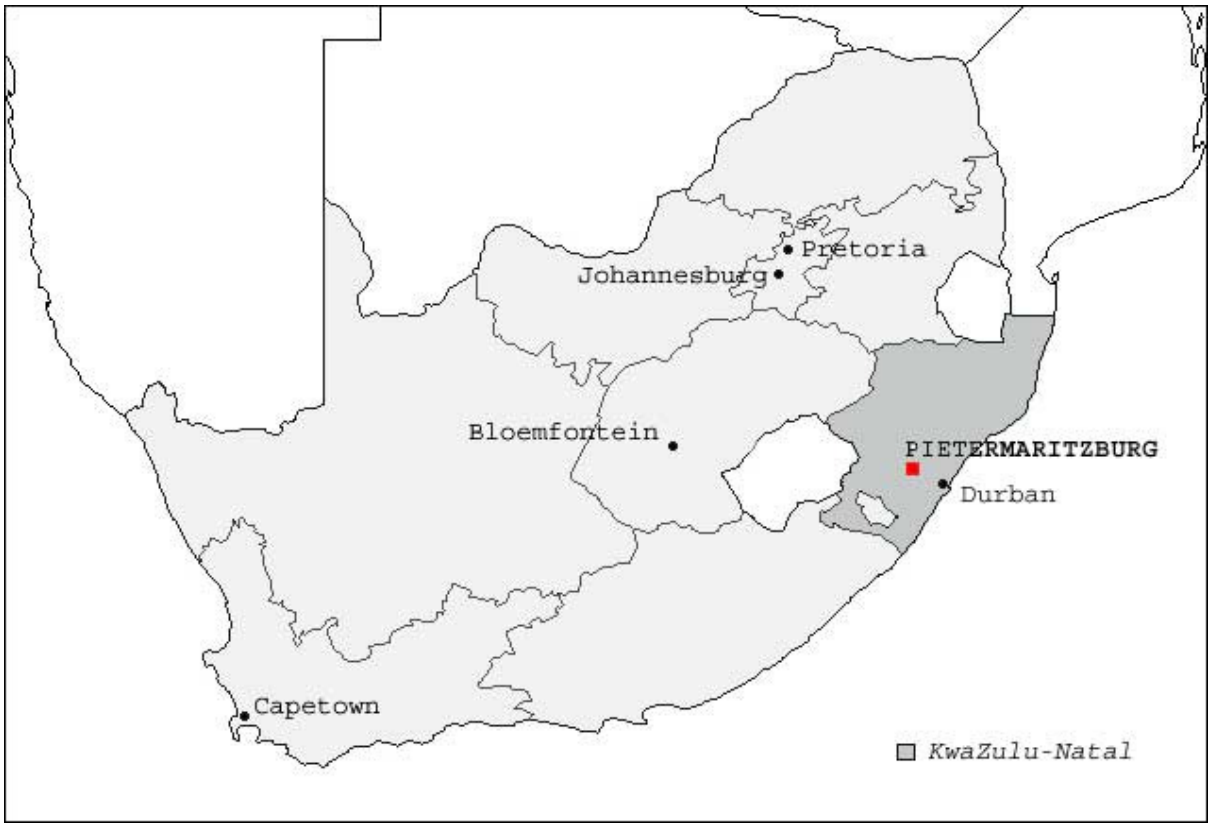

***Figure 1.1**: Map of South Africa showing the location of Pietermaritzburg within KwaZulu-Natal province*

1.1.1 Regulatory Framework

Though this study focuses on non-regulatory participatory processes, it is nonetheless important to understand the national and local regulatory framework with respect to water quality, as it is within this environment that stakeholders act and interact. The national Department of Water Affairs and Forestry (DWAF) is the main policy coordination and regulatory body, charged with implementing and administering the *National Water Act* (NWA) of 1998; the DWAF thus has responsibility for both water quantity and quality, including effluent discharges (de Coning & Sherwill, 2004). Under the *Water Services Act* of

1997, the DWAF also oversees the provision of drinking water and sanitation by municipalities and their designated water services providers; the DWAF's regulations cover, *inter alia*, the control of 'objectionable substances' entering storm water drains or watercourses, and the prevention of storm water from entering sewer systems (DWAF, 2002). At the local level, Msunduzi Municipality (of which the City of Pietermaritzburg is a part) is the main agency with jurisdiction over water-related powers and functions, including responsibility for sewer networks and industrial effluent bylaws. Umgeni Water, the regional water services provider, is a parastatal which conducts regular water quality testing and supports the municipality with regard to pollution monitoring and enforcement. While this framework appears to provide comprehensive regulation of water quality, in practice, both the DWAF's and the municipality's implementation and enforcement activities have been limited by a lack of institutional capacity (Hamann & O'Riordan, 2000; Pole, 2002). This is exacerbated by poor coordination and clarification of roles among staff at the DWAF, the municipality and Umgeni Water, as well as confusion surrounding the powers of municipalities to assume responsibility for enforcement and prosecution powers set forth by the national legislation (Pole, 2002).

However, the existing decision-making structure appears set to change. Catchment Management Agencies (CMAs), consisting of representatives from the various interested parties within watershed regions, are due to be established under the NWA to make decisions with regard to catchment-level water resource management (DWAF, 2007). If CMAs are constituted as currently envisaged, local actors will have a publicly-accessible and open forum, endowed with decision-making power and tasked with involving local communities, at which to present their issues and information – a sharp contrast to the current situation, where communication generally takes place directly between the interested party and DWAF. As the existing plan calls for the establishment of only 19 CMAs covering the entire country, local stakeholders will have to play a critical role in informing the representatives at each regional-scale CMA. The balance of power is thus likely to shift, as DWAF's role progresses toward one of providing structures and information, while decision-making increasingly becomes the responsibility of the CMA members themselves.

1.1.2 Stakeholders

It is within this regulatory context that stakeholders along the Baynespruit operate. As has been discussed, Msunduzi Municipality and Umgeni Water play important roles with regard to water pollution monitoring and enforcement. Within civil society, the most active non-government organization (NGO) working on water quality issues is the Duzi-uMngeni Conservation Trust (DUCT), a group originally formed by recreational users of the local

watercourses. Along the lower reaches of the Baynespruit, the main stakeholders include: the industries located in the WIA, particularly the edible oil producers and others who discharge effluent into sewers and storm drains along the river; local residents, both in Sobantu and in nearby formal and informal settlements, such as Cinderella A, who both contribute to and suffer from the litter and sewage pollution problems; and farmers in the Sikhuthele Community Club (formerly Co-op 1) and other Sobantu residents who require water from the Baynespruit for irrigation purposes.

1.2 Need for the Study

Pollution, as shown in Figure 1.1, has been a serious problem in the Baynespruit for at least two decades. Efforts such as the community-oriented Baynespruit Clean-up Campaign in 2001 were declared successful because "the participants now appreciate the importance of a clean environment and the need to rehabilitate the Baynespruit" (Umgeni Water, 2002: 42), but conditions in the stream remain dire. A number of factories have repeatedly been discovered in violation of established discharge regulations, but recourse to the legal provisions of the criminal justice system has been largely unsuccessful (Pole, 2002). In 1997, a Catchment Management Forum was established for the uMsunduzi river, of which the Baynespruit is a tributary, and its watershed. Representatives from the Sobantu Environmental and Agricultural Forum (SEAF), the DUCT, and regulatory agencies and parastatals, including DWAF, Msunduzi Municipality and Umgeni Water are all represented, though there has not been regular participation from industry; the state of the Baynespruit has been discussed at length by the Msunduzi Catchment Management Forum (MCMF), but as yet the actions taken have not proven effective (MCMF, 2008). Despite these various fora and initiatives, there has been no apparent improvement in the condition of the Baynespruit.

This research will thus attempt to uncover the reasons why past efforts have not led to lasting change, and what factors may allow and encourage stakeholders to bring about significant pollution reduction in the future. While there is a wealth of information to be found on factors motivating citizen participation, there has not been a significant volume of research generated on regulatory agency and industry participation, or on multi-stakeholder processes in particular; it is hoped that this study will contribute to the latter bodies of work. With respect to local water resources, governance and pollution, the situation in Pietermaritzburg has been the subject of two recent Masters' theses. The research conducted by Pole (2002) into the failure of the application of the 'polluter pays principle' to industries polluting the Baynespruit was particularly informative. In fact, a number of citizens expressed the view that as the judicial process has indeed been unsuccessful in reducing pollution, a multi-stakeholder participatory approach is perhaps the best way forward.

***Figure 1.2**: A stormwater outfall along the Baynespruit, showing pollution from both solid and liquid waste*

Source: J. Butler, DUCT

In early 2008, members of the DUCT discussed the possibility of establishing a Baynespruit Conservancy, which would involve all interested parties in an effort to address the serious pollution problems in the stream. Identifying the possible non-regulatory incentives and barriers to participation should help ensure that this new initiative has the opportunity to succeed where similar projects have failed in the past. Moreover, once the CMA structure is in place regionally, organisations such as the Conservancy will be instrumental in ensuring that local water-related information and issues are brought to the attention of this forum. As a working example of integrated environmental management, the Conservancy should be well-placed to capitalise on the organisational capacity of resources such as the Pietermaritzburg campus of the University of KwaZulu-Natal and the headquarters of Umgeni Water to support its initiatives. The vision guiding the research is therefore that of a Baynespruit Conservancy in which all stakeholders work together effectively to address and reduce the serious solid and liquid pollution problems in the stream.

1.3 Statement of the Problem

This research stems from the practical problems outlined in the preceding sections. The current socio-ecological system in which all Baynespruit stakeholders contribute to its pollution, whether through action or benign neglect, must somehow be altered in order to effect change. Previous targeted initiatives and state prosecution, operating within the existing power and information structures, have failed to achieve lasting results. One

possible way to work toward reducing the pollution problems is to involve all stakeholders in a more co-operative participatory process; a key element will therefore be the use of incentives and the removal or transcending of barriers to participation. To accomplish this, the perspectives of each stakeholder group (citizens and NGOs, industries, and regulatory agencies and parastatals) must first be understood, with respect to both the pollution problems and their effects. The various economic, situational, developmental and socio-cultural factors that encourage and discourage participation on the part of each stakeholder group must then be identified in order to foster a multi-stakeholder process in which all participants are empowered to bring about the changes necessary to reduce pollution.

1.4 Objective of the Research

The overall objective of the research was to determine how non-regulatory barriers and incentives can influence stakeholder participation in reducing water pollution in Pietermaritzburg's Baynespruit. To achieve this, the specific objectives were to:

a) analyse past initiatives that have tried to address pollution in the Baynespruit, including the identification of lead stakeholder(s), goals, difficulties encountered and likely reasons for lack of success;
b) understand stakeholders' views of the problem, by identifying the main stakeholders among industry, local residents, NGOs, and regulatory agencies and parastatals, determining what they see as the major issues and their effects, and identifying the perceived importance of the problems; and
c) identify barriers and incentives to participation, including economic, situational, developmental and socio-cultural factors.

1.5 Clarification of Concepts

Participation

Generally defined as 'the act or fact of taking part', participation in the context of this study implies something more active than passive, a process of co-operation and learning among individuals in a group (Rahnema, 1992). Participation should forge relationships and trust among participants, and build their capacity in terms of knowledge and skills to empower them to make decisions and create change (Beierle & Cayford, 2002).

Stakeholder

A stakeholder can be defined as any person or group with an interest or share in something. With respect to environmental issues, stakeholders may include national and local governments, other regulatory agencies, resource users, landowners, community members,

and other citizens (Mullen & Allison, 1999); in this study three groups are recognised: residents and NGOs, industries, and regulatory agencies and parastatals. Multi-stakeholder processes involve bringing together carefully-selected representatives from each interested and affected group (Kilvington, 1998) in order to develop shared understandings, collaboratively resolve conflict and make better decisions.

Non-regulatory

Regulatory methods to control pollution generally involve a command and control approach, in which authorities set emissions or technological standards to which polluters must adhere. Non-regulatory approaches include tax incentives, tradable permits, information disclosure, media campaigns targeting consumers, and voluntary cooperation (Afsah *et al*., 1997; Khanna, 2001; Wheeler, 1999). As economic incentives and tradable permits nonetheless involve a degree of government regulation, this dissertation focuses on the latter non-regulatory means.

Barrier

A barrier is something that blocks or impedes action. For the purposes of this study, a barrier is something that discourages or prevents participation, and various researchers have grouped barriers (or disincentives) to participation into different categories (see, for example Gaventa & Valderrama, 1999; Prestby *et al*., 1990). In the context of this study, barriers are categorised as economic, situational, developmental or socio-cultural in nature.

Incentive

An incentive is something that motivates action. For the purposes of this study, an incentive is something that encourages or facilitates participation; various researchers have grouped incentives (or benefits) to participation into different categories (see, for example Afsah *et al*., 1997; Prestby *et al*., 1990; Widmer, 1989). To maintain consistency, incentives, like barriers, are classified as economic, situational, developmental or socio-cultural in this study.

1.6 Research Methodology

Just prior to its confluence with the larger uMsunduzi river, the Baynespruit flows past the community of Sobantu, an established, relatively homogenous Zulu neighbourhood with a population of some 10 000 people. Though most residents live in formal houses with electricity, municipal refuse collection, water and sanitation, unemployment remains a problem. Many residents work at the two dozen factories in the nearby WIA; owners and management at these companies tend to be of European or Indian heritage, as do regulatory agency and parastatal employees dealing with pollution issues. Pollution of the Baynespruit

and contamination of the municipal sewer system by industrial effluent has been an ongoing problem, as has faecal pollution caused by stormwater infiltration into ageing sewers, illegal connections, blockages and informal settlement areas with inadequate sanitation. The main NGO in the region advocating for environmentally-healthy local watercourses is the DUCT, which has established partnerships to clean up waste, remove alien invasive species, plant trees, and implement education and awareness campaigns. All of these stakeholders were represented in the semi-structured interviews conducted following a purposive sampling protocol, in which members of each stakeholder group were specifically targeted.

This study took the form of a quasi-participatory case study. The research techniques employed included semi-structured interviews, documentation, participant observation and direct observation. The main measuring instrument was an interview consisting primarily of open-ended questions, conducted anonymously. Data analysis mainly involved the creation of a detailed descriptive narrative. Direct interpretation of the various sources of evidence and the recognition of patterns in the data were used to achieve an understanding of the potential for various stakeholders to become fully involved in meaningful participation. The raw data were summarised to identify common elements within and among stakeholder groups, and barriers and incentives to participation were also categorised as economic, situational, developmental or socio-cultural.

1.7 Delimitations and Limitations

This study focuses on the stakeholders living, working and/or recreating along the lower reaches of a single tributary of the uMsunduzi river, the Baynespruit. In addition to regulatory agencies and NGOs concerned with the entire catchment, two particular stakeholder groups along the lower reaches of the stream (where pollution is most pronounced) were targeted: companies in the WIA discharging stormwater to the stream, and residents living in the community of Sobantu along its banks.

Given that the Sobantu neighbourhood is an established community with an 80-year history, serviced with water, sewer, electricity and tarmac roads, it is not possible to extrapolate the data gathered there to all other communities, particularly informal settlements, elsewhere in the catchment.

While this research formed part of a larger initiative to establish a functioning Baynespruit Conservancy to address the serious solid and liquid pollution in the stream, it focussed solely on the identification of barriers and incentives to stakeholder participation, without specifically attempting to address possible solutions.

1.8 Sequence of Chapters

This dissertation consists of five chapters, which are summarised here. Chapter 1 begins by outlining the issues affecting the Baynespruit and the various stakeholders who contribute to and are affected by the river's pollution problems. It goes on to describe how this study contributes to finding solutions, and provides a vision of the ideal outcome. The research problem and objectives are then set out. In the next section, some of the key concepts are explained in relation to this study. This is followed by a brief description of the research methodology, as well as the boundaries and shortcomings of the research.

The research process necessarily begins with a review of the available literature pertinent to the subject under study, and this is discussed in Chapter 2. The chapter begins with a review of the general issues surrounding water pollution and approaches to addressing the problem. It then continues with a discussion of the nature of participation and stakeholders, and the possible outcomes of multi-stakeholder participatory processes. Barriers to participation faced by each stakeholder group, as well as their relative importance, are then explored, and this is followed by a similar discussion with regard to incentives.

The research design and methodology followed in carrying out this study is described in Chapter 3. By way of introduction to the research setting, the chapter begins with a portrayal of the characteristics of the area and the stakeholders involved, followed by a description of the techniques used to address the research objectives. The next section provides an explanation of the research methodology, including the measuring instrument used. The procedures that were followed to carry out the research are then set out, followed by an account of how the data were interpreted and analysed. Finally, issues of data validity and reliability are addressed.

Arguably the most important part of the dissertation, the presentation and discussion of results, is the subject of Chapter 4. This first section discusses the history of pollution in the Baynespruit and analyses the past initiatives which have attempted to address it. Next, stakeholders' views of the problem are discussed by group (local residents and NGOs, industries, and regulatory agencies and parastatals). This is followed by an examination of the findings with respect to barriers to participation on the part of each group, while a similarly-structured discussion of incentives completes the chapter.

Chapter 5 presents the conclusions drawn from the research and makes a number of recommendations. The first section summarises the key findings discussed in Chapter 4 and puts the significance of the results in context. The following section highlights how the

dissertation has answered the original research questions and draws conclusions about the importance of the various categories of barriers and incentives to each stakeholder group. The final section makes recommendations for each stakeholder group with regard to addressing pollution in the Baynespruit, suggests improvements to the research methodology, and sets out possible future research into this topic.

1.9 Summary

This chapter provided an overview of the pollution affecting the Baynespruit, the stakeholders who both contribute to and are affected by it, and the regulatory environment in which they operate. It went on to describe how this study proposed to identify non-regulatory barriers and incentives to these same stakeholders' participation in reducing water pollution in the stream. To achieve this aim, the first step was to delve into the relevant literature; Chapter 2 summarises the information gleaned from a diversity of sources with regard to the nature of participation itself, as well as the distinct barriers and incentives experienced by the different stakeholder groups.

Chapter 2: Literature Review

2.1 Introduction

Water pollution is not a problem unique to Pietermaritzburg's Baynespruit, and this chapter begins by exploring the causes of water pollution and the various factors that contribute to its persistence. It goes on to examine some possible approaches to addressing pollution problems. Next, it explores the nature of participation and multi-stakeholder processes, which underpin this study. Finally, the relevant literature on barriers and incentives to stakeholder participation is presented with respect to the three stakeholder groups (local residents and NGOs, industries, and regulatory agencies and parastatals) and four categories of barriers and incentives (economic, situational, developmental and socio-cultural) used in this study.

2.2 Water Pollution

The sources of water pollution are many, including "untreated domestic sewage, uncontrolled industrial discharges, deforestation and poor agricultural practices that result in soil erosion and leaching of nutrients and pesticides" (Kraemer *et al*., 2001: 1). Considering how important clean water is to human survival, it seems counter-intuitive that anthropogenic pollution of the planet's water resources is so widespread. However, in his influential piece *The Tragedy of the Commons*, Hardin (1968) recognised pollution as among those phenomena in which logical decision-making by each of many resource users leads to the overuse and devastation of common resources for all users. Becker and Ostrom (1995) define common resources as those from which it is not feasible to prevent use by any 'potential beneficiary', and from which the amount used by one beneficiary is no longer available to others. The problem with such resources is that individually, resource users (including those who use a given resource for disposal of waste) have no incentive to limit their use and are in fact likely to benefit, at least in the short-term, from undermining sustainability (Berkes, 2004; Dietz *et al*., 2002). Hence the prediction that in the future, Africa's water resources will come under increasing threat from "untreated sewage, eutrophication, pollution from oil and gas fields and industrial effluents mainly generated by small-scale industries" (Kraemer *et al*., 2001: 4).

However, Rowe (2008: 142) points out "that the problem is not common ownership per se but rather open access – that is, commons in which there are no social structures or formal rules to govern access and use". Especially in the case of water pollution, because it flows downstream, exploitation for individual or corporate gain is inevitable within such open-access systems, as decisions are taken by those to whom most or all of the benefits – and

few or none of the costs – will accrue (Ghai & Vivian, 1992; Vivian, 1992). Rowe (2008) thus proposes a management system which functions more like a trust, in which decisions are made based on long-term sustainability and the sharing of benefits among stakeholders. This is essentially the approach taken by South Africa and other countries that have developed legislation intended to safeguard water resources for all citizens. In practise, however, the strategy has not succeeded. Kraemer *et al*. (2001) blame the failure of the command and control approach, particularly in developing countries, on a lack of government resources to carry out effective monitoring and enforcement, exacerbated by factors such as corruption and the trumping of environmental concerns by economic growth. In fact, the World Bank found a positive linear relationship between increasing per capita income and declining intensity of organic water pollution in its study of a dozen developed and developing countries (Wheeler, 1999), indicating that the least-developed countries suffer from the worst pollution.

Given that developing countries are unlikely to be able to devote more resources to policing water pollution in the short-term, they have been looking instead to new methods that take advantage of existing resources and leverage points. In such systems, "regulation is information intensive and transparent [and] environmental agencies … become more like mediators and less like dictators. Community representatives take their place at the negotiating table along with regulators and factory managers. Market agents make their presence felt through the decisions of consumers, bankers, and stockholders" (Wheeler, 1999: 3). However, the management of water resources is not only about the control of point sources of pollution, but includes any manipulation that affects water quantity or quality (Mollinga, 2008). The need to take into account all water resources, along with environmental necessities and human pressures from the full range of stakeholders, has thus led to the development of Integrated Water Resources Management (Molle *et al*., 2008).

When it comes to sustainable management of such complex systems, it is important that system boundaries be clearly delineated, that all stakeholders are involved in decision-making, and that monitoring be reinforced by penalties (Becker & Ostrom, 1995). Kraemer *et al*. (2001) point to collaborative partnerships among diverse stakeholders, and the need for all stakeholders to be well-informed, as critical to successful stewardship. All this is best accomplished at a local level, where it is possible for "social mechanisms … such as communication, trust, and the ability to make binding agreements" to control fundamental self-interest (Dietz *et al*., 2002: 5). Locally-based management bodies are also better positioned to learn from and react to the systems for which they are responsible (Berkes, 2002). Be it part of a larger legal framework, such as a CMA, or simply a locally-instituted

arrangement, natural resource management is thus best conducted by local stakeholders (Egger & Majeres, 1992). The following sections outline two of the many options such stakeholders may use to address water pollution.

2.2.1 Voluntary Environmental Agreements

One of the most promising potential outcomes of stakeholder participation in non-regulatory processes addressing pollution is the Voluntary Environmental Agreement (VEA). Though some experts limit their definition of VEAs to those made between regulators and firms, or commitments made unilaterally by firms (Khanna, 2001), others include VEAs made between firms and NGOs, between regulators and NGOs, and among multiple stakeholders (Karamanos, 2001). Acutt (2003) sees VEAs as part of the 'corporate responsibility' approach, in contrast to 'corporate accountability', which is accomplished by regulatory means. Khanna (2001) classifies these non-mandatory agreements as:

- public voluntary programmes, in which companies agree to meet government-set environmental performance targets in exchange for benefits such as recognition, technical assistance and tax concessions;
- bilateral initiatives, in which targets are negotiated between the regulatory agency and a company or an industry, often in lieu of tighter legislation and enforcement; or
- unilateral initiatives, in which companies draw up their own targets or agree to meet targets developed by an industry group or a certifying body.

However, Acutt (2003) replaces the second category with agreements negotiated among two or more parties. An example of public voluntary programmes are those of the U.S. Environmental Protection Agency, such as Green Lights, in which companies pledge to reduce pollution by set amounts or to certain levels; examples of unilateral initiatives include ISO 14000 or Forest Stewardship Council certification, while McDonald's restaurants' joint work with the Environmental Defense Fund to reduce waste could be considered a bilateral initiative (Acutt, 2003; Lober, 1998).

One of the caveats of such agreements is that without any penalties for non-compliance, firms may use them to project a positive image while masking problems or a lack of commitment to fundamental change (Acutt, 2003; Khanna, 2001). However, despite being non-binding, VEAs are generally backed by regulatory threats and are becoming increasingly common in places such as Europe, Japan and North America (Karamanos, 2001). In South Africa, certain types of VEAs are provided for under the *National Environmental Management Act* (NEMA), and have been pioneered by industries in the public eye, such as mining and chemical companies (Hamann & Acutt, 2003). Acutt (2003) theorises that multi-stakeholder VEAs have become widespread in South Africa not only as

a result of the post-apartheid focus on participatory democracy, but also due to the limited resources of regulatory agencies. This latter issue can become a problem in the absence of adequate monitoring and enforcement (and participation by civil society): industries themselves can end up steering the process, and poor performers may dodge accountability (Hamann & Acutt, 2003). On the other hand, some such agreements with civil society actors actually commit companies to aim for even higher standards than those set by regulatory agencies. One example is that of a gasification facility planned for the city of Hamilton in the province of Ontario, Canada where the proponents have agreed to strive for mercury and particulate emission limits put forth by a citizens' group which are tighter than those required by their operating certificates (Environment Hamilton, 2008). In South Africa, some of the first VEAs were negotiated with petroleum refineries in Durban South, where Environmental Cooperation Agreements were made between government agencies, led by the Department of Environmental Affairs and Tourism (DEAT), and companies; unfortunately penalties and incentives were unclear, and civil society was marginalised, creating a breakdown of trust with residents and other 'third party' stakeholders (Acutt, 2003). More successful was a Good Neighbour Agreement negotiated directly between Engen and representatives from the local community, with support from regulatory agencies in the form of inclusion of the agreed conditions into Engen's refinery permit (Acutt, 2003). As we shall see in the following section, compliance with such agreements may be monitored by citizens themselves.

2.2.2 Community Environmental Monitoring

Community Environmental Monitoring (CEM) is variously known as 'community-based monitoring', 'volunteer ecological monitoring' and, particularly in North America, 'citizen science'. It generally involves people who are not professional scientists documenting the natural world and/or human effects on the environment by recording information, for example about plants and animals, water quality, or air pollutants. CEM "is simply the gathering of data, usually through observation or the collection of samples by lay persons. The majority of volunteers participate by monitoring some aspect of their local area" (Caiger & Coad, 1997: 1). Such monitoring programmes may meet a variety of goals, including providing baseline data "to evaluate the effectiveness of conservation activities", advance warning of impending ecological crises, and "the scientific basis for management action" (Munishi, 1996: 10). Some voluntary programmes compliment data gathered by government scientists while educating citizens and involving them in planning for sustainability, while others are targeted toward specific issues, involving data collection for advocacy work or multi-stakeholder monitoring (Whitelaw *et al*., 2003). In addition, "the presence of a monitoring team act as a deterrent to illegal activities" (Munishi, 1996: 10), which is important in itself and also hints at monitoring work focussed on the identification and mitigation of pollution sources.

Both Caiger and Coad (1997) and Whitelaw *et al*. (2003) outline a number of benefits of CEM. First, citizens carrying out monitoring in their own area have the advantage of local knowledge which professional scientists may not possess; a volunteer who has lived in an area for years will often have a wealth of information about the local environment. Second, residents have a sense of community ownership and are therefore generally enthusiastic citizen scientists, often increasing their participation in public processes in general. Third, effective scientific monitoring often involves regular field work done over an extended period of time outside office hours, and governments can save costs when residents carry out this work. Fourth, regular monitoring may also allow residents to document changes that professional scientists on brief field visits may not notice, and point to areas where more intense scientific study may be necessary. Fifth, community members will likely be the first to notice problems like illegal harvesting or dumping, which can then quickly be reported to the appropriate authorities. Finally, CEM can be used as an educational tool, allowing participants to develop and/or share their knowledge of the natural world, scientific methods and environmental impacts.

Some of the largest CEM projects involve documentation of the natural world to identify changes over time, for example in bird species numbers or the dates on which water bodies in cold climates freeze in the fall and thaw in the spring. However, CEM can also measure pollution, such as the 'Bucket Brigades' programme started by an American organisation called Global Community Monitor (GCM), which involves a simple method of testing air quality using a sampling device inside a modified five-gallon plastic bucket. Their work has led to the formation of citizens' groups monitoring air quality in Australia, Canada, England, India, Kazakhstan, Kenya and South Africa, as well as the United States (GCM, 2006). The key is involvement by local experts in designing sampling protocols, and local laboratories in conducting the analysis. Where these partnerships can be developed, community members benefit from both greater awareness and the resources to address corporate environmental pollution (Turner & Wu, 2002). Such partnerships can prove particularly important when it comes to the reliability of the data collected. The development of standardised protocols geared to participants' skills (Whitelaw *et al*., 2003), along with rigorous training for volunteers are key factors in ensuring that the data generated is accepted as valid not only by regulatory agencies, but also as part of any subsequent legal proceedings (Penrose & Call, 1995).

One of the most widespread programmes is Water Watch, which has chapters throughout Canada and the U.S., functions as a national network in Australia, and is just being established in India and Malaysia. Most chapters and networks consist of community or

school groups who carry out physical and chemical testing along with ecological assessment to measure the health of their local watercourses. The group Global Water Watch also supports community-based water monitoring projects in Brazil, Ecuador, Mexico, the Philippines, Thailand and China.

2.3 Stakeholder Participation

Water pollution poses serious challenges to the health of both human residents and the environments of which they are a part. Two potential approaches to such problems, VEAs and CEM, have been outlined. However, to be effective, these initiatives must at some stage be addressed through multi-stakeholder participatory processes, concepts which are explored in the following sections.

2.3.1 The Nature of Participation

"The words 'participation' and 'participatory' appeared for the first time in the development jargon during the late 1950s" (Rahnema, 1992: 117) and they have been the focal points of water policy development since the 1970s (Mollinga, 2008). Over the decades, these concepts have been lauded for their ability to improve relations and foster trust, resolve conflict, broaden awareness and create shared understanding, build confidence and capacity, and create empowerment (Beierle & Cayford, 2002; Servaes & Arnst, 1999). Some experts have suggested that participation is a goal in itself, while others see it as the means to accomplishing other goals (Burke, 1968), such as achieving consensus among diverse interests (Global Water Partnership, 2000). Attempting to define the term can be difficult, though; as White (1994: 16) points out, the concept is a "fragile and elusive … complex and dynamic … [and] undoubtedly contextual" one. Participation can be broadly described as an organised and equitable process which facilitates the exchange of thoughts and information (Appelstrand, 2002), or it may consist "of any strategies employed by social actors to alter their life-world" (Warner, 2006: 17). It may be short-term or long-term (Glew *et al*., 1995: 396) and it may take place within formal institutional contexts or more informally (Warner, 2006). While some maintain that participation must involve stakeholders directly, rather than engaging their elected representatives (Gaventa & Valderrama, 1999), others include indirect engagement through representatives as a form of participation (Global Water Partnership, 2000). Gaventa and Valderrama (1999) discussed three different types of participation: social and project participation, in which citizens take part in government or civil society programmes; political participation, in which they take part in the democratic process; and citizenship participation, in which citizens become involved in governance itself, including policy- and decision-making, particularly at the local level.

"Participation requires that stakeholders at all levels of the social structure have an impact on decisions" (Global Water Partnership, 2000: 16). The degree of impact may vary widely, though, and participation does not mean the same thing to everyone (Renn *et al*., 1993). In 1968, Burke identified a number of strategies for involving community members in decision-making, suggesting that the method employed should be based on the goal of the public participation exercise. While participation may in some cases act as a means to develop self-confidence among participants, allowing them to take on responsibility for making decisions and bringing about change, in others the ultimate goal may be to change participants' behaviour; yet other citizen participation strategies may be designed to recruit volunteers to carry out a part of an organisation's mandate, to co-opt influential groups or individuals to increase legitimacy, or to build a broad base of support by leveraging existing power structures in order to argue from a position of strength (Burke, 1968). Not everyone would agree with Burke that all of these methods involve true participation, partly because some of his characterisations do not involve one of the most common elements of participation found in literature: the concept of stakeholders exerting, or attempting to exert, control or influence over decisions and outcomes which concern them (Appelstrand, 2002; Gaventa & Valderrama, 1999; Irvin & Stansbury, 2004; Singer, 1995) - in other words, power. Power is a function of the relationships and resources which a person or an organisation can exert to achieve a desired outcome, in spite of opposition (Lozare, 1994). With regard to natural resource issues, power comes in many forms, including occupying positions of authority, possessing information, having financial means, being able to rally support, or enjoying privileged access (Borrini-Feyerabend *et al*., 2004). Many citizens do not hold any of these forms of power, and Arnstein's seminal 1969 paper, "A ladder of citizen participation", thus categorised participation based on the degree to which participants were able to wield power and influence by participating.

Arnstein's central thesis was that participation "is the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future" (1969: 216). She thus presented an analysis of various exercises in participation based on the idea that with increasing power comes increasing influence and decision-making authority (Smith & McDonough, 2001). The first two categories on her ladder, manipulation and therapy, she wrote off as essentially public relations vehicles in which citizens are involved in activity but there is no genuine participation (Arnstein, 1969). This may be acknowledged at the outset, or may be a strategy employed by those who have learned how to covertly control, co-opt and even re-direct participants, while still being able to claim to have implemented participation (Rahnema, 1992). Arnstein called the next three categories - informing, consultation and placation –

'tokenism', and other experts have since supported this view, noting, for example, that there is more to participation than consultation alone (Global Water Partnership, 2000). Irvin and Stansbury (2004) observe that 'informing', in which plans are presented by officials to citizens, sometimes without so much as an opportunity for comment, remains a popular tool despite its shortcomings. Both Dungumaro and Madulu (2003) and Gaventa and Valderrama (1999) cite numerous cases in which local communities' involvement was solicited for consultation to fulfill the requirement for participation, but no community members took part in actual decision-making. Placation, in the form of bodies such as citizen advisory boards, is a slight improvement on consultation, but authorities remain in control of structures and information (Arnstein, 1969; Berkes, 2002; Irvin & Stansbury, 2004). All three of these forms of 'participation' may be measured in terms of attendance at meetings, the number of questionnaires completed, or the number of proposals reviewed, but lack any accountable channel for feedback and may simply be used to legitimise official decisions (Arnstein, 1969; Global Water Partnership, 2000). Some have labelled these strategies 'pseudo-participation' (White, 1994).

At the top of her ladder, Arnstein (1969) designates three categories which consist of true citizen participation: partnership, delegated power and citizen control. One of the central themes at these levels is that citizens share in, or even control, the process. All affected stakeholders should thus become involved in the early stages of planning, long before decision-making occurs (Appelstrand, 2002; Involve, 2005). In such processes, what Borrini-Feyerabend *et al*. (2004) call 'entitled actors' are involved in developing the participatory framework, as well as sharing knowledge, resources and responsibilities via participation. With regard to natural resources, stakeholders must recognise their "common problem and [that] all parties are going to have to sacrifice some desires for the common good … [and accept] the need for change" (Global Water Partnership, 2000: 16). True participation must redistribute unequally-shared power, and is therefore likely to be resisted by vested interests (Lozare, 1994; Servaes & Arnst, 1999; Vivian, 1992), who are usually less than forthcoming in ceding it (Arnstein, 1969, Gaventa, 2004). Such participation is thus bound to lead to conflict (Vivian, 1992), which explains the idea of making sacrifices in order to reach collaborative solutions. On the other hand, Smith and McDonough (2001: 239) noted that "although many organizations attempt public participation, their efforts often fail to resolve conflicts, lead to greater support for decisions, or raise the level of trust between citizens and publics". Based on their study of people who took part in a participatory process around natural resources management in Michigan, they proposed looking at participation in terms of both procedural and distributive justice. They postulate that decision-making which is

perceived to be fair (whether or not the outcome is seen as favourable) is key to building and maintaining trust and support among participants (Smith & McDonough, 2001).

Participation undoubtedly has its limitations. Some authors have pointed out that it is not particularly efficient and "can lead to developments that are of an unpredictable nature" (Servaes & Arnst, 1999: 115). Participation "may not only slow down decision-making processes, it may actually lead to complete inaction by taking the place of real change" (Involve, 2005: 22). Others have noted that to gain the necessary knowledge and skills to make confident decisions, stakeholders may be required to invest years of commitment in participatory processes (Singer, 1995). However, the prevailing sentiment among proponents is that participation, like democracy, must be acknowledged as costly and time-consuming, but that the benefits outweigh the costs (Appelstrand, 2002). They argue that the improved quality of the decision-making must be considered, as top-down decision-making not only runs the risk of excluding certain information and considerations, but also of not being supported – or possibly actively contested – by those affected (Involve, 2005). The sustainability of implementation without participatory decision-making is thus called into question (Servaes & Arnst, 1999).

2.3.2 Identifying Stakeholders

Having explored various interpretations of participation, the focus must now shift to those who are actually doing the participating: the stakeholders. According to Borrini-Feyerabend *et al*. (2004), the term 'stakeholder' was popularised in the field of business management, and has its origins in the colonisation of North America, when pioneers used stakes to mark the borders of the land to which they wished to claim title. While this interpretation implies the appropriation of as much of the resource as possible, Warner (2006: 17) takes a more neutral view, noting that anyone with a 'stake' in something has an interest in it or a claim to it. This view can be expanded to include anyone who may affect or be affected by a decision, be it an individual or an organisation (Involve, 2005), though Borrini-Feyerabend *et al*. (2004: 40) make a distinction between individuals and institutional stakeholders, the latter being the "bearer[s] of specific interests and concerns organised to express them and carry them forward". Whatever its derivation, the term 'stakeholder' has become widely accepted in the literature. According to the World Bank, stakeholders "are individuals, groups or institutions that are concerned with, or have an interest in the water resources and their management" (Warner, 2006: 17). When it comes to an essential resource like water, though, in reality everyone is a stakeholder (Global Water Partnership, 2000; Warner, 2006) – but unfortunately it is impossible for everyone to participate. Representation thus becomes important, whether it be direct representation in which there is close interaction between the

representative and those who designate him or her, or indirect representation, in which an individual represents people with whom he or she rarely interacts, for example elected officials or NGO appointees (Borrini-Feyerabend *et al*., 2004).

Determining who constitutes an essential stakeholder and how much representation each stakeholder group should be accorded is no easy task. It is of great importance, though, as a diversity of stakeholders is one of the keys to an effective forum (Mullen & Allison, 1999). With respect to water and other natural resource management issues, the list of stakeholders is long, including local users, businesses and industries, government agencies with relevant mandates at the national, regional and/or local level, environmental groups, academic and research institutions, elected officials, interest groups such as downstream users, influential individuals, and of course citizens (Borrini-Feyerabend *et al*., 2004; Griffin, 1999). The four groups targeted during the establishment of catchment committees in Sweden, for example, were point and non-point source polluters, experts, water authorities, and the general public (Jonsson, 2005). In this thesis, stakeholders are categorised into three basic groups: government agencies and parastatals playing a regulatory role, for-profit corporations (in this case industrial operations), and affected citizens and non-profit interest groups such as NGOs. Each experience a variety of barriers and incentives to participation, and each bring different forms of knowledge, from social interests to technical expertise, to the process (Renn *et al*., 1993). But having identified stakeholders is just the first step. Next, they must participate.

According to some experts, whether or not stakeholders participate is determined by the perceived balance between benefits, such as achieving goals, and costs, often in time and money (Klandermans & Oegema, 1987; Singer, 1995). In addition to the realisation of some benefit, Burke (1968) set forth a number of conditions that must exist for individuals to commit to participatory decision-making, including identification with and validation from other group members, and a shared awareness of the issues. Different stakeholders may respond differently to participatory processes based not only on their individual traits, but also on the nature of the process itself (Glew *et al*., 1995). All participatory processes "can be enhanced through better organization, improved participation strategies and mechanisms, and integration with other aspects of decision-making" (Carnes *et al*., 1998: 402). This last point is key, as people are far more likely to accept and work toward implementing a decision which they played some role in making (Burke, 1968). This begins to explain the attraction of multi-stakeholder participation.

2.3.3 Why Stakeholder Participation?

> *"Technocratic decision making is incompatible with democratic ideals. The involvement of affected parties represents the political value of government by the people, not just for the people. If we take the ideal of democracy seriously, public participation is a normative prerequisite."*
>
> (Renn *et al*., 1993: 210)

Although this statement seems to have been written from an American perspective, it nonetheless encapsulates the driving force behind stakeholder participation. As has already been discussed, understanding the knowledge, expertise and points of view of various stakeholders can assist in better understanding problems (Warner, 2006), while involving stakeholders in decision-making can lead to better decisions that have greater legitimacy (Involve, 2005). However while these claims are generally accepted, as has been noted there is considerable variation in the format of participatory decision-making and the degree to which power is delegated (Renn *et al*., 1993). A general description of a multi-stakeholder participatory process is one in which all relevant stakeholders come together to recognise a common problem and the need for cooperation in addressing it, and to work together toward developing and implementing solutions (Warner, 2006). 'Relevant stakeholders' may include all interested and affected parties, as well as experts and other citizens, all of whom contribute different expertise and experience (Renn *et al*., 1993). In fact, in his survey of participants in a multi-stakeholder forum regarding health care in Canada, Singer (1995) noted that government representatives, experts, elected officials and citizens were most commonly identified as those who should be involved in what he termed 'combined decision-making' about this particular issue. He also noted that 'self-selected' members of the community who were eager to participate would be preferable to randomly-selected individuals. Renn *et al*. (1993: 190) based their argument for "multi-actor, multi-value, and multi-interest" representation on the need to capture "three forms of knowledge": that "based on common sense and personal experience", that "based on technical expertise", and "knowledge derived from social interests and advocacy". Dungumaro and Madulu (2003) identified another consideration which is especially important in natural resource issues, the need to incorporate indigenous knowledge. Keeping in mind that stakeholder groups will vary by issue, the next important ingredient becomes the participatory process itself.

In his study of multi-stakeholder platforms in southern Africa, South America, southern Asia and Europe, Warner (2006) identified six different types, from those with little influence, such as social networks or focus groups, through to broader social movements and eventually to 'river basin (co)management organizations', where decision-making is delegated to stakeholders. It is this last type which most would consider true multi-stakeholder

participation. In a survey of public, private and civil society stakeholders conducted to evaluate public participation programmes within the United States Department of Energy's Office of Environmental Management, Carnes *et al*. (1998) identified a number of attributes of successful public involvement. The three most highly rated by all respondents were that "the decision-making process is accepted as legitimate by stakeholders", that the Department "understands public concerns", and that "the decision-making process allows full and active stakeholder representation" (Carnes *et al*., 1998: 392). The core of this process is trust among stakeholders, which, as Acutt (2003: 20) emphasises, "can only be earned through good governance and transparency". Efforts must be made to build this trust, as stakeholder participation is often critical to the success of a project. Dungumaro and Madulu (2003) describe cases in Tanzania where a lack of community participation led to the failure of water management projects. One project failed because the necessary skills required for equipment use and infrastructure maintenance were not imparted to the local participants, while another collapsed after local participants refused to take part in the project, likely due to a lack of understanding stemming from insufficient outreach (Dungumaro & Madulu, 2003).

There are undoubtedly a number of criticisms of multi-stakeholder fora. Stakeholders have a range of interests, which may not be compatible, and thus overcoming pre-existing animosity and past experiences among stakeholders is very important to the building of trust (Cornwall, 2004; Dungumaro & Madulu, 2003; Involve, 2005). Unfortunately this is not always easy, particularly in South Africa where past interactions between civil society and industry, which was often complicit in the apartheid system, have been less than positive (Hamann & Acutt, 2003). This level of suspicion can colour new relationships and lead to a general unwillingness to engage in participatory processes, which, by their very nature, involve cooperation (Hamann & Acutt, 2003). Even where pre-existing issues do not influence stakeholders' perceptions of each other, the fact that their perceptions, interests and objectives can be diverse and even opposed can easily create conflict (Lozare, 1994). In fact, in the United States watershed councils were often established as a result of the need to resolve conflict among stakeholder groups (Griffin, 1999). The use of interest-based negotiation, in which diverse stakeholders' underlying needs are balanced in order to achieve equitable and mutually satisfactory results, is a good way to overcome conflicting positions (van Wyk *et al*., 2006). This consensus approach contrasts with rights-based negotiation, in which each stakeholder defends his or her perceived entitlement. Moving toward such a scenario, in which stakeholders are motivated to understand each others' positions and regulatory agencies foster equitable interaction – if necessary redressing the power and information disparities among stakeholders – is particularly important with regard to water resources (Dent, 2001; van Wyk *et al*., 2006).

These inequities among stakeholders are not the only obstacles facing participatory processes once the interested parties are brought to the table, though. Not surprisingly, the more confident, knowledgeable and experienced stakeholders may well monopolise discussions (Involve, 2005). It has been noted that participants in multi-stakeholder fora may lack training and expertise as well as accountability, that they may not be truly representative of their constituency, and that they may be manipulated (Renn *et al*., 1993: 203). Glew *et al*. (1995) caution that in order for a participatory process to create substantial changes in participants' attitudes, it must involve a long-term, ongoing experience. Irvin and Stansbury (2004) point out that geographically-limited multi-stakeholder processes where participants are representative of, and influential within, the main local constituencies are more likely to be effective. On the other hand, Griffin (1999), notes that leaving decision-making about water resources solely in the hands of local stakeholders may result in the exclusion of potentially important input from further afield, leading to a maximisation of local benefits to the detriment of a more comprehensive, holistic approach. While not all these problems are likely to beset every participatory process, they are common enough to hinder success.

If such hurdles can be overcome, though, successful multi-stakeholder processes can lead to three strategic outcomes identified by Warner (2006):

- 'adaptive management', the development of a shared understanding leading to a joint future vision through group learning, experimentation and compromise;
- 'democratization and empowerment', the devolving of responsibilities to a representative forum which is not dominated by any one interest but gives voice to the concerns of marginalised groups in its discussions; and
- 'alternative dispute resolution', in which conflict is managed through mediation and the ultimate goal is consensus (where possible).

If conducted well, participation can lead to greater empowerment on the part of all stakeholders involved, be they individuals or organisations, as they develop increasing 'participatory competence' (Prestby *et al*., 1990) and assume positions of importance among fellow decision-makers (Irvin & Stansbury, 2004). Therefore, "if participation is such an important ingredient for the development of individual empowerment, it is imperative that we understand what promotes and what hinders participation" (Prestby *et al*., 1990: 144).

2.4 Barriers

"[T]he possibility for engagement cannot be taken as a given, even if mechanisms [for participation] are created" (Gaventa, 2004: 30). When certain stakeholder groups face barriers that prevent their participation, the outcome of a multi-stakeholder process is

unlikely to be representative (Griffin, 1999) and may in fact be rejected by the stakeholders who were denied involvement. Removing or overcoming these barriers to participation should thus be of great importance. In their survey of studies done in several African, Asian and Latin American countries, Gaventa and Valderrama (1999) identified several key barriers to participation, including the absence of enabling legislation and policy and the political will to use it, power relations, participants' level of knowledge and skill, a consultative rather than truly participatory process, and insufficient funding or lack of control over financial resources. Individual stakeholders may be discouraged or prevented from participating by other factors, for example if the timing of meetings is inconvenient or if the venue is not a convenient, neutral location (Borrini-Feyerabend *et al*., 2004; Smith & McDonough, 2001). As shall be discussed, all of these barriers affect different stakeholder groups to different degrees. It is worth noting that while Prestby *et al*. (1990) make a distinction between barriers to participation and costs of participation, as this dissertation is concerned with long-term participation – which may be cut short by costs – it does not recognise costs as separate factors.

Widmer (1989) classifies barriers and incentives to participation in four categories: material (tangible elements such as goods or services), social (intangible elements such as status), developmental (intangible personal elements such as acquiring knowledge or responsibilities) and ideological (intangible personal elements such as satisfaction or gratification). For the purposes of this study, which will examine participation on the part of stakeholders ranging from large companies to individual citizens, four categories of barriers will be used: economic (financial costs), situational (e.g. time, physical conditions), developmental (knowledge, skills and/or ability) and socio-cultural (e.g. power inequity, level of community organisation).

2.4.1 Local Residents and NGOs

For citizens and members of NGOs, barriers to participation may be as basic as monetary, physical or time constraints (Griffin, 1999; Klandermans & Oegema, 1987; Wandersman *et al*., 1987). For disadvantaged individuals, one of the most basic barriers to participation is a lack of financial resources (Global Water Partnership, 2000) and/or prohibitive costs (Prestby *et al*., 1990), as well as a prioritisation of income-generation and daily family needs over attending meetings (Irvin & Stansbury, 2004; Wandersman *et al*., 1987). Basic situational barriers include physical access problems for people with disabilities, child-care for parents of young children, or language barriers where translation is not feasible (Involve, 2005). Simply not having the time to devote to an intensive participatory process can also be an important factor (Negra, 1998). In fact, this was by far the most common explanation given

(by 45% of respondents) in one Canadian survey of reasons for non-participation in consultative processes in the Grand River watershed (Griffin, 1999). Similar results were found by Wandersman *et al*. (1987) in their study of participation in neighbourhood organisations in Israel and the Unites States. Other logistical barriers to citizen and NGO participation include the scheduling of meetings (weekdays versus evenings or weekends), their length, and the location at which they are held (Griffin, 1999); factors such as a nearby meeting location can be especially important for certain participants (Irvin & Stansbury, 2004). As a result of these considerations, low-income earners and the self-employed are unlikely to be well-represented, while homemakers, retirees and public servants are often over-represented (Renn *et al*., 1993). Finally, the Grand River study found that approximately one-fifth of respondents declined to participate because they "thought the meeting would be a waste of time"; though more of a disincentive than a barrier, a participatory process that is long on talk but short on effective action may thus also discourage long-term participation (Berkes, 2002; Griffin, 1999: 512), as may dissatisfaction with progress achieved (Prestby *et al*., 1990; Wandersman *et al*., 1987).

Another significant barrier to citizen participation is developmental, in which individuals lack the specific knowledge and skills to understand and address the issues at hand. In one Canadian study of community participation in decision-making about health care provision, researchers found that while citizens were eager to be consulted as part of the process, they increasingly favoured leaving decision-making to the experts as the intricacies of the process were explained (Singer, 1995). In the Grand River watershed study discussed previously, 21% of respondents who declined to participate did so because they felt they "lacked the information to make a useful contribution" (Griffin, 1999: 511). This suggests that a lack of knowledge, skills and experience can deter citizens from fully participating in situations involving scientific or technical information. Even when technical details are explained to citizen participants, they may not be adequately understood (Burke, 1968). In interviews conducted with members of local Conservation Commissions in the American states of Vermont and New Hampshire, Negra (1998) encountered some participants who felt that new members needed background knowledge in order to have credibility, while others felt that experience could be developed through participation; in the former case, people without the necessary expertise may in fact be discouraged from participating. Even if they do participate, individuals without the relevant knowledge or skills may devalue their own contributions based on their perceived lack of expertise (Jonsson, 2005) or be overpowered by technical arguments or misinformation from 'professionals' (Arnstein, 1969; Gaventa & Valderrama, 1999).

Lack of power or decision-making authority can also act as a barrier to participation by ordinary citizens (Irvin & Stansbury, 2004). Given that "the control of the structure and processes for participation - defining spaces, actors, agendas, procedures - is usually in the hands [of] governmental institutions", and may be controlled by local elites or even NGOs, citizens can fairly easily be excluded by elected officials and bureaucrats, especially at the local level (Gaventa & Valderrama, 1999: 7). Even when they are invited to participate, citizens often do not anticipate being able to influence decision-making. This is important, as Klandermans and Oegema (1987) found in their study of people asked to take part in activities organised by the Dutch peace movement: while 10% of people who eventually participated expected their participation to have no impact, this figure rose to 25% among eventual non-participants. Wandersman *et al*. (1987) point out that this scepticism about their ability to effect change is disproportionately found among the disadvantaged.

In the aforementioned Grand River watershed study, almost one quarter of respondents opted not to participate because they did not expect their input to be taken into consideration (Griffin, 1999). This could be due to the perception of an unresponsive lead agency merely 'going through the motions' of consultation, or it may be created by an unrepresentative forum in which a particular viewpoint or interest group dominates decision-making (Irvin & Stansbury, 2004; Smith & McDonough, 2001). Smith and McDonough (2001) describe a survey of public participants in an Ecosystem Management Project in Michigan in which some citizens felt they could not wield any influence unless they joined a group or hired legal representation. Power inequity can also contribute to government-administered participatory processes unwittingly excluding key stakeholders (Gaventa & Valderrama, 1999), because they are "outside the usual networks … [which] may reinforce existing inequalities of power and access to resources" (Involve, 2005: 29). Even in cases where all key stakeholders are represented, though, if a forum reaches a decision which is then ignored or overruled by the responsible government agency, it can reinforce participants' powerlessness, resentment and cynicism (Griffin, 1999; Involve, 2005; Irvin & Stansbury, 2004; Negra, 1998). The knowledge that key decisions are actually taken outside the participatory process, whether it is explicitly acknowledged at the outset or not, is a major disincentive to participation (Glew *et al*., 1995; Irvin & Stansbury, 2004; Prestby *et al*., 1990).

Other socio-cultural barriers can also play a role in limiting citizen participation. A lack of co-operation from authorities and peers (Wandersman *et al*., 1987), feeling unwelcome within the group (Prestby *et al*., 1990), or a desire to avoid conflict (Burke, 1968) may all discourage participation. Vivian (1992: 70) notes that "the social, economic and political structures which influence community dynamics" also play an important role. For example,

Gaventa and Valderrama (1999) found that participation was positively correlated with the pre-existing level of citizen organisation (such as unions) in a Bolivian study, suggesting a degree of fluency in, and/or social encouragement of, participation. At the other end of the spectrum, complacency can be equally problematic (Mullen & Allison, 1999; Negra, 1998). Irvin and Stansbury (2004) describe a watershed management planning process in Omaha, Nebraska in which a poorly-defined problem and general satisfaction with existing management, among other factors, resulted in an almost complete lack of citizen participation. Jonsson (2005) found the same problem in rural Sweden, where residents' adequately-functioning water provision systems did not provide them with any incentive to get involved in broader water resource management. This problem is not only to be found in developed countries, but also in developing countries where 'learned dependency' has resulted in the loss of self-reliance among communities who have become conditioned to expect external solutions (Servaes & Arnst, 1999); fortunately, self-reliance can be developed through participation (White, 1994).

In some cases, cultural norms may discourage or prevent participation by certain groups (Glew *et al.*, 1995; Involve, 2005), while residents of certain regions may simply not have a history of active involvement (Mullen & Allison, 1999). When cultural differences exist among participants, even among individuals from the same area, communication barriers may arise (Servaes & Arnst, 1999). Factors such as class, ethnicity and gender can also play a role in creating the power imbalances discussed previously (Berkes, 2004). This effect can be subtle, influencing people's confidence and world view, and thus the nature of their participation; listeners quickly form perceptions based, for example, on a speaker's accent or choice of words (Gaventa, 2004). Interestingly, Wandersman *et al.* (1987) found that in the United States and Israel, in contrast with much of the literature on participation, factors such as education and race could not predict participation in neighbourhood associations, possibly because such groups are perceived as more accessible than larger multi-stakeholder fora. In general though, whether citizens live in the United States or China, those who are "richer, more educated, and better able to bargain because they have more employment options" are the ones who can bring pressure to bear on pollution problems; unfortunately, the poor are the ones who tend to live in more polluted areas to begin with (Wheeler, 1999: 75). For citizens and members of NGOs, therefore, situational, developmental and socio-cultural barriers appear to be of roughly equal importance, while economic barriers disproportionately affect the disadvantaged.

2.4.2 Industry

When it comes to pollution, "the rational man finds that his share of the cost of the wastes he discharges into the commons is less than the cost of purifying his wastes before releasing them" Hardin (1968: 1245). As long as a company perceives the costs of preventing pollution to be higher than the costs of not doing so, economic logic will dictate that it continues to pollute. Taking externalities into account, for example by instituting a 'polluter pay' system, can increase the costs of polluting and address this barrier. Resistance to organisational change is another powerful barrier preventing participation on the part of industry. To undertake measures such as pollution prevention, a company must re-envision all its processes (Lober, 1998). Unfortunately, "corporations do not widely view pollution prevention as an opportunity as its potential benefits are rarely recognized. Corporations also do not identify the factors that prevent or allow the marshaling of resources to exploit this potential opportunity" (Lober, 1998: 35). Perhaps an even more compelling barrier for a company that is resistant to change is the fact that participation usually requires more transparency related to information disclosure and independent assessment (Acutt, 2003).

Though more a disincentive than a barrier, firms may be reluctant to participate due to satisfaction with the status quo. As Afsah *et al*. (1997) point out, regulatory agencies tend to be lenient on firms with political clout or those facing economic difficulties, in the latter case for fear of being held responsible for job losses; they note that examples of such lax enforcement can be found in countries as diverse as Indonesia and the United States. If a company has managed to avoid compliance with existing laws and does not anticipate implementation of stricter legislation in the future, there is no incentive for it to participate. Another barrier is the transparency required by participation, which reduces the opportunity for corruption (Wang *et al*., 2004) from which some may benefit. Finally, companies may simply view social and environmental concerns as the purview of government, not something which is part of a business mandate (Hamann & Acutt, 2003). For industry, then, participation is mainly limited by economic and situational barriers.

2.4.3 Regulatory Agencies and Parastatals

Three of the main barriers to initiating participatory processes for government and quasi-government agencies are essentially economic, in the form of time, direct costs and staff resources (Griffin, 1999). Participatory decision-making can be complex and time-consuming (Porto *et al*., 1999; Servaes & Arnst, 1999); insufficient financial resources, especially at the local level, may constrain provision of opportunities for citizen participation (Burke, 1968; Gaventa & Valderrama, 1999). Even in rich nations like Sweden, budget cuts have meant a move away from 'mutual learning' processes of late (Jonsson, 2005). It is far quicker and

less expensive to allow an informed civil servant to take a decision than to engage in consultation, and extensive consultation can drain resources from other important work (Involve, 2005; Irvin & Stansbury, 2004). Burke (1968) therefore notes that agency-led participatory processes must take into account both the mandate and means of the lead department, to ensure that staff have the time and resources to identify community leaders and other key players, assist participants in developing an accurate and complete understanding of the issues, and facilitate meaningful participation. While individual staff members at regulatory agencies and parastatals may be willing to commit to a participatory process, they may be relatively powerless in promoting involvement unless legislation exists to provide for it, and there is political will to encourage it (Gaventa & Valderrama, 1999). While South Africa does not lack enabling legislation, with cooperative governance forming a pillar of both the Constitution and the NEMA, political support may not be as strong. However, even if staff members are successful in instituting a multi-stakeholder process, bureaucratic rules and regulations may limit real engagement (Glew *et al*., 1995).

The very fact that agencies are themselves the decision-making bodies may be a disincentive to participation, as they retain the final authority regardless of whether or not they participate (Griffin, 1999). Participation can also bring greater scrutiny and pressure to increase transparency with regard to monitoring and enforcement activities (Afsah *et al*., 1997). Moreover, if instituting multi-stakeholder engagement will result in an agency being required to cede some of its power, this can be an additional disincentive (Griffin, 1999). Elected officials and bureaucrats, especially at the local level, may view participatory decision-making as undermining their role (Involve, 2005; Servaes & Arnst, 1999). Unfortunately, a flawed participatory process (for example, one unduly influenced by special interests) can lead to poor decision-making, but having given up control, government agencies and politicians may have no choice but to acquiesce (Irvin & Stansbury, 2004). This problem can be compounded by the fact that while officials are accountable to the public for their actions, participants in multi-stakeholder processes generally are not (Griffin, 1999; Involve, 2005; Renn *et al*., 1993). This may increase agency concerns about delegating authority to participants who are not perceived as having the necessary knowledge and experience to make decisions about technically-challenging issues (Involve, 2005). It must be noted that these caveats may not apply to the most formal multi-stakeholder bodies. For example, under the South African NWA, CMAs are constituted as legally-accountable entities functioning under a governing board and holding prescribed powers and responsibilities (Thompson *et al*., 2001).

A final, but potentially important, barrier comes into play when regulatory agencies themselves are part of the problem. Research shows that globally, state-owned operations can be responsible for some of the worst pollution, and in Asia, they tend to emit more pollution and put fewer resources into abatement than firms in the private sector (Wheeler, 1999). In such cases, not only do all the aforementioned barriers apply, but so do the financial and organisational change issues associated with industry stakeholders. Yabes (1992: 130) summarised some of the main barriers in his study of the Philippines' Ilocos Norte Irrigation Project (INIP) as follows: "… the participatory approach was resisted by some INIP staff because it was felt to be too time-consuming, and because it would increase the complexity of project tasks, raise project costs, expand staff accountability, and change the status quo of planning methods". Overall then, economic, situational and to some extent socio-cultural barriers limit regulatory agency and parastatal participation.

2.5 Incentives

An incentive is something that motivates action, or in this case, participation. In their study of neighbourhood associations in New York City, Prestby *et al*. (1990) found that what they termed 'incentive management' was one of the most important factors determining groups' success or failure (which meant remaining active or becoming inactive). They placed what they called motivating 'benefits' of citizen participation into three categories: material (tangible rewards such as goods or services), solidarity (benefits derived from social interaction, such as status or recognition) and purposive (benefits derived from organisational goals, including community improvement) (Prestby *et al*., 1990). As discussed previously, in her classification system, Widmer (1989) uses four categories: material, social, developmental (intangible personal elements such as acquiring knowledge or responsibilities) and ideological (intangible personal elements such as satisfaction or gratification). With regard to corporations, Afsah *et al*. (1997) note that 'reputational' incentives - how the company is perceived - can be important. For the purposes of this study, the same four categories used for barriers will be used to classify incentives: economic (financial or material benefits), situational (e.g. convenience of location, improving conditions), developmental (e.g. learning, networking) and socio-cultural (e.g. influencing decisions, recognition).

2.5.1 Local Residents and NGOs

With respect to citizens and NGO members, the data on material incentives is unclear (Klandermans & Oegema, 1987), but they appear to be relatively unimportant (Prestby *et al*., 1990; Wandersman *et al*., 1987). However, it should be noted that where the alternative is litigation or other legal action, engaging in a participatory process is obviously advantageous

in terms of cost avoidance (Dent, 2008). Basic logistical incentives include limiting the number and length of meetings, providing child care, and offering safe transportation to and from meetings (Prestby *et al*., 1990). Other situational incentives are related to perception. Stakeholders are far more likely to be motivated to participate if they recognise the existence of a problem and are sufficiently concerned about it to want to effect change (Burke, 1968; Mullen & Allison, 1999). For example, the afore-mentioned study of neighbourhood organisations carried out by Wandersman *et al*. (1987) found that members of such residents' associations perceived more problems, and therefore more need for action, than did non-members - though both groups were equally satisfied with their neighbourhoods.

One of the advantages to citizens of involving themselves in multi-stakeholder processes is gaining new knowledge, skills and experience – including developing their ability to advocate effectively (Irvin & Stansbury, 2004; Prestby *et al*., 1990). From a practical perspective, participants in Alabama's Water Watch programme, for example, are taught skills ranging from water quality monitoring to the development of improvement strategies (Mullen & Allison, 1999). Developmental incentives can work both ways, though. Some stakeholders are actually more inclined to participate if they feel they have knowledge and expertise to contribute (Negra, 1998), whether this be through formal education and training, or personal – and often local – experience (Involve, 2005).

Perhaps the most important factors in determining an individual's willingness to participate are socio-cultural. Wandersman *et al*. (1987) found that people with strong roots in a community, who had lived there for a considerable length of time or planned to stay in the area, were more likely to participate in neighbourhood associations. One of the main incentives for citizen and NGO participants is the perceived ability to make a difference through participation (Burke, 1968; Mullen & Allison, 1999). This usually takes the form of having some influence over the decision-making process (Irvin & Stansbury, 2004) which will affect their lives in the future. Mirroring the disincentive to long-term participation found when stakeholders were dissatisfied with achievements made, progress and accomplishments were found to be an incentive for continued involvement (Burke, 1968; Wandersman *et al*., 1987). Participating in a multi-stakeholder forum is also likely to result in citizens forming relationships with influential individuals, contacts which may prove valuable. Especially for marginalised individuals, such interaction can be empowering (Irvin & Stansbury, 2004). A number of authors highlight the importance of providing not just collective but also personal (selective) incentives (Klandermans & Oegema, 1987; Prestby *et al*., 1990), so that individuals have some motivation to participate themselves, rather than assuming someone else will make the effort. Mullen and Allison (1999), for example, note that two of the three

factors determining which groups within the Alabama Water Watch programme are most robust are whether volunteers live near the waterbody and/or use it for recreation. However, many people participate initially simply due to a personal contact and continue because they appreciate the social interaction and recognition, while others are motivated by the desire to contribute to their communities (Negra, 1998; Prestby *et al*., 1990). Other social incentives include a welcoming environment at meetings, the opportunity for social interaction (Prestby *et al*., 1990), and a sense of group identity (Burke, 1968). While situational and developmental incentives are important for citizens and members of NGOs, socio-cultural incentives play a greater role.

2.5.2 Industry

There is no question that for industrial stakeholders, the threat of financial penalties in the form of either discharge fees or fines and legal costs associated with legislative enforcement can act as powerful incentives to undertake pollution reduction programmes (Bansal & Roth, 2000; Triana & Ortolano, 2005). After all, factory bosses only allow pollution because they want to reduce costs, and if it becomes more cost effective to put abatement measures in place, they will (Wheeler, 1999). Thus governments are making increasing use of regulated economic incentives such as pollution charges and tradable permits (Kraemer *et al*., 2001). Nonetheless, in their study of large firms in polluting industries in Belgium, Buysse and Verbeke (2003: 453) found that "environmental leadership is not associated with a rising importance of environmental regulations, thereby suggesting a role for voluntary cooperation". Despite Lober's (1998: 36) vision of pollution prevention as an opportunity for 'corporate self-renewal', for profit-driven companies the most important incentives are generally economic ones. Within industrial operations, reviewing processes in order to achieve pollution prevention and environmental innovation can result in direct financial benefits such as reduced costs for disposal, material and liability, as well as increased efficiency and competitiveness (Bansal & Roth, 2000; Lober, 1998; Wheeler, 1999). Incentives may also be provided by regulators in the form of subsidies, or technical information and assistance (Khanna, 2001). A study of companies in Colombia noted that some were motivated to cut pollution due to environmental audit requirements imposed by parent multi-national corporations (Triana & Ortolano, 2005). Direct financial incentives, whether derived from production methods, regulators, or corporate owners and customers, are thus very important in motivating environmental progressiveness for industrial stakeholders.

One may rightly question how such measures undertaken by industries relate to participation in multi-stakeholder fora; for companies though, receptiveness to such initiatives is all part of

what Bansal and Roth (2000) term ‘corporate ecological responsiveness’. Their study of companies in the United Kingdom and Japan found that many firms were motivated by risk avoidance, for example avoiding clean-up costs or bad publicity by being proactive in addressing issues before they became problems. Practical situational incentives, such as improved health and safety conditions, or social incentives, such as better community relations, may also play a role (Khanna, 2001), though the latter depends on the culture in which a firm operates: Bansal and Roth (2000) found that firms in the U.K. were far more likely than those in Japan to concern themselves with their rapport with the local community. Sometimes communities make themselves heard through “social, political or physical sanctions”, examples of which Wheeler (1999: 59) documents from places as far-ranging as India and Brazil. The most innovative and progressive companies in the U.K./Japan study, though, tended to have strong environmental leadership and be focussed on social responsibility, along with the benefits to employee morale derived from simply doing ‘the right thing’; unfortunately such firms were very much in the minority (Bansal & Roth, 2000). In South Africa, for example, only 21% of the 100 largest companies by revenue produce a corporate responsibility (CR) strategy for public consumption (KPMG, 2008). These most advanced companies are also the most likely to work cooperatively with other stakeholders and to undertake commitments such as the VEAs discussed earlier (Buysse & Verbeke, 2003).

For firms that do not take a proactive stance, public pressure and regulators that make environmental performance information available to consumers can be very powerful motivators (Afsah *et al*., 1997; Khanna, 2001; Kraemer *et al*., 2001; Wang *et al*., 2004; Wheeler, 1999). After Indonesia’s Environmental Impact and Management Agency, BAPEDAL, began publicly revealing manufacturing companies’ environmental compliance and performance status using a simple five-category colour-coded system, within 18 months more than one quarter of the firms which had been non-compliant had achieved compliance (Afsah *et al*., 1997; Wheeler, 1999). A later programme in the Philippines, modelled on Indonesia’s, achieved equally impressive results in inducing compliance (Wheeler, 1999). Using a similar system, called GreenWatch, China’s State Environmental Protection Agency also documented improved compliance rates during pilot projects (Wang *et al*., 2004). Information disclosure is also used by regulators in countries such as Canada, the U.K. and the U.S. (Khanna, 2001; Kraemer *et al*., 2001), and where civil society is particularly active, NGOs may use information disclosure not just to target companies themselves, but also their clients and suppliers (Buysse & Verbeke, 2003). Conversely, when corporations are recognised for their achievements, they benefit not only from good external publicity, but also from employee validation and motivation (Triana & Ortolano, 2005).

This incentive depends heavily on the importance of reputation, though: an obscure firm may be relatively immune, while one in the public eye, or a company supplying such a firm, may experience significant market gains or losses based on pollution abatement or other environmental performance measures (Afsah *et al.*, 1997). Despite the lack of consensus among experts on the importance of customers, shareholders and the local community in influencing corporate environmental policies (Buysse & Verbeke, 2003), such use of public pressure and market forces has recently become a major factor in spurring corporate participation. While local communities may exert social pressure, consumers and investors may apply financial pressure, not only by boycotting known polluters and their products (Buysse & Verbeke, 2003; Wang *et al.*, 2004), but also by granting preference to corporations given public recognition of environmental achievements (Buysse & Verbeke, 2003; Khanna, 2001). In South Africa, "sustainability reporting … is influenced by three major factors: the extent of a company's environmental impact, its size, and its exposure to international markets and investors", with both the first and last factors owing to internally- or externally-imposed norms and pressures (KPMG, 2008: 93).

While the afore-mentioned study of large Belgian firms found that multi-national affiliates gave greater consideration to international customers and had more proactive environmental strategies than domestic firms (Buysse & Verbeke, 2003), other surveys conducted in southeast Asia, India and Mexico found no difference between the two groups (Wheeler, 1999). However, multi-nationals do tend to respond more rapidly to pressure such as negative information disclosure, often due to customer demands (Lober, 1998; Wheeler, 1999). Perhaps counter-intuitively, one study of the reaction of stock values to environmental news about a company found far larger increases (in reaction to good news) and decreases (in reaction to bad news) in emerging Latin American markets than in developed North American markets (Wheeler, 1999). In South Africa, large companies may be motivated both by local pressure and by the need to conform to accepted international environmental standards (Acutt, 2003). All of these 'reputational' factors can motivate companies to collaborate in good faith as part of multi-stakeholders processes (Afsah *et al.*, 1997). On the other hand, Hamann and Acutt (2003) caution that some firms may be motivated to participate in multi-stakeholder processes only to enhance their image, attempt to control the process, or both. Therefore, while some industry incentives may involve situational and socio-cultural elements, the majority are primarily economic.

2.5.3 Regulatory Agencies and Parastatals

Government and quasi-government agencies are tasked with upholding and complying with legislation which enshrines pollution prevention. Involving stakeholders in the decision-

making process may allow these agencies to save costs by reducing confrontational enforcement activities (Jonsson, 2005; Mullen & Allison, 1999) and avoiding expensive litigation (Irvin & Stansbury, 2004; Jonsson, 2005). A study undertaken by Porto *et al*. (1999) found that since the creation of river basin committees composed of stakeholders and civil society in Brazil's Ceará state, 80% of conflicts over water were resolved by the committees rather than in the courts. By moving beyond an enforcement approach, they may also be able to achieve more in terms of compliance, and with fewer resources, providing a dual incentive. The former executive director of the Corporación Autonoma Regional del Valle de Cauca, a regional infrastructure development and environmental protection organization in Colombia, attributed 70% of his agency's highly-effective industrial water pollution control programme's influence and success to the co-operative work his staff undertook directly with industry (Triana & Ortolano, 2005). While this collaborative approach may work best with environmental leaders (Buysse & Verbeke, 2003), by consulting with industry, government agencies can achieve a better understanding of the challenges involved in pollution abatement and show themselves to be willing partners. This strategy can work equally well with citizens: by involving them in the identification of both problems and acceptable solutions, it is possible to induce positive changes in behaviour (Dungumaro & Madulu, 2003).

While it may not earn them goodwill in industry circles, regulators may also opt to 'partner' with civil society by disclosing environmental performance information. A budget that did not allow for effective enforcement of regulations and a rapidly-expanding manufacturing sector prompted Indonesia's BAPEDAL (mentioned previously) to begin publicly revealing environmental compliance information. Not only did the initiative cost far less than traditional enforcement, the subsequent attention that was focussed on the programme forced BAPEDAL to devote more resources to both inspections and data quality - resulting in better-targeted action - and raised both industry employers' and employees' levels of awareness of regulations (Afsah *et al*., 1997); all of this undoubtedly increased the agency's effectiveness.

Government agencies and parastatals may view participatory processes as a method by which to inform and educate the public and other stakeholders, and it is true that such processes can focus public attention and broaden awareness (Jonsson, 2005). For example, Kilvington (1998) documented increased public involvement arising simply from the fact that a multi-stakeholder catchment management group had been struck in the Whaingaroa Catchment near Hamilton, New Zealand. However, government agencies and parastatals may also learn from stakeholders (Appelstrand, 2002; Jonsson, 2005), and being familiar

with community preferences can prove particularly useful when policies are being developed (Irvin & Stansbury, 2004), because “experts and regulators are often restricted in their assessment of a project … local specifics or other dimensions of concerns [sic] are often neglected. Public participation helps to include these concerns in the decision making process and to avoid potential consequences of which the experts involved were not aware" (Renn *et al*., 1993: 209). Equally important is the opportunity to address concerns and build trust (Irvin & Stansbury, 2004), which should help to prevent delays and inefficiencies when it comes to project implementation (Jonsson, 2005).

Another incentive for regulators is that participatory processes lead to decisions that are better understood and seen as more legitimate by the public (Appelstrand, 2002; Carnes *et al*., 1998; Irvin & Stansbury, 2004). Involving all stakeholders is not only more likely to result in broad-based support for decisions, but should also reduce conflict among stakeholders, often an equally desirable outcome for regulatory agencies (Griffin, 1999; Jonsson, 2005). While the ceding of decision-making power was discussed as a barrier to government agency and parastatal participation, the reverse of this argument is that it allows agencies to avoid making, and taking the blame for, controversial decisions (Griffin, 1999). In fact, sometimes taking a facilitation approach to multi-stakeholder negotiation between industry and affected parties such as local residents and NGOs can produce the desired outcome while also garnering community support (Wheeler, 1999). Even if this ideal outcome does not materialise, engaging stakeholders is at the very least more productive than avoiding action on sensitive issues altogether, which is the easiest option (Dent, 2008). For regulatory agencies and parastatals, then, economic, situational, developmental and even to some degree socio-cultural incentives can affect participation.

2.6 Summary

This chapter presented a survey of some of the literature relevant to water pollution, the nature of stakeholder participation and the various barriers and incentives facing different stakeholder groups. It also outlined some possible approaches to maximising participation. The literature described herein was critical to informing the design of this particular research, which is described in Chapter 3. It focuses on the particular situation of Pietermaritzburg’s Baynespruit, and the methodology used in this study to identify non-regulatory barriers and incentives to stakeholder participation in reducing water pollution.

Chapter 3: Research Design and Methodology

3.1 Introduction

To address the various objectives of the research, the research design and methodology included a number of different techniques as part of a case study approach. The analysis of past initiatives that have tried to address pollution in the Baynespruit included the use of historical print media coverage and expert consultations. Some direct and participant observation was also used to better understand stakeholders' existing engagement and their views on the issues. However, the main research tool used in this study was semi-structured interviews conducted with individual stakeholders from government agencies and parastatals, industry, and local residents and NGOs. These interviews provided the basis for identifying stakeholders' perceptions of the Baynespruit's pollution problems and their effects, as well as the economic, situational, developmental and socio-cultural barriers and incentives to participation that exist for each stakeholder group. Data analysis was primarily descriptive, undertaken through interpretation and coding, with due regard for issues of reliability and validity.

3.2 Research Design

The aim of the research was to determine how non-regulatory barriers and incentives can influence stakeholder participation in reducing water pollution in the Baynespruit. The case study research design, explored in the following section, was thus determined by the setting in which the study was conducted, which is outlined thereafter.

3.2.1 Case Study Research

A case study involves research into one system (or a small number of systems) studied in context, about which in-depth, detailed information is collected (Hammersley & Gomm, 2000; Monette *et al.*, 2002; Welman *et al.*, 2005). Case studies allow for the exploration of complexity and uniqueness, something that is often impossible using other research methods (Orum *et al.*, 1991; Stake, 1995; Welman *et al.*, 2005; Yin, 1994). Though case studies enable a comprehensive understanding of a given situation or phenomenon, they face criticism in terms of their subjectivity and generalisability (Monette *et al.*, 2002). On the other hand, they allow for "the grounding of observations and concepts … in natural settings studied at close hand" and often encourage the development of new theories (Orum *et al.*, 1991: 6). In fact, one of their goals is to allow the data themselves to generate the ideas, rather than making use of the data to support existing ideas (Monette *et al.*, 2002).

While case study research was pioneered in Europe (Tellis, 1997a), the Department of Sociology at the University of Chicago is credited with popularising the technique in the early 1900s through research work conducted into the immigrant experience and other aspects of urban sociology (David, 2006, Tellis, 1997a). Though the case study as a research tool seemed to fall out of favour after World War II, it has experienced a resurgence in recent years (Orum *et al.*, 1991). In fact, Hammersley and Gomm (2000), attribute the perceived waning of interest merely to the replacement of the term 'case study' by other phrases, such as ethnography, coined to describe essentially the same research approach.

There is some debate about whether the case study is a methodological approach or a research paradigm (Hammersley & Gomm, 2000). Whichever definition one favours, case studies are extensively used not just in sociological research, but also in law, medicine, management, political science, history, teaching and other fields (David, 2006; Yin, 1994). Case studies may be exploratory, descriptive, explanatory or comparative (David, 2006; Tellis, 1997a; Yin, 1994), and they often use a narrative approach (Hammersley & Gomm, 2000; Jocher, 2006). This exploratory case study took the form of an in-depth investigation into the stakeholders directly affecting, and affected by, pollution in the Baynespruit water course. According to Stake (1995), the most important consideration is therefore to learn as much as possible about the case, rather than being concerned about representativeness. Gaining such a "deep, rich appreciation of the individuals or situations from whom the data were collected" (Monette *et al.*, 2002: 450) necessitates a comprehensive approach to data collection. Yin (1994) emphasises the importance of using multiple sources of evidence when conducting case study research, in order to achieve data convergence. While case studies usually make use of qualitative methods, these many data sources may also include quantitative methods (Monette *et al.*, 2002; Orum *et al.*, 1991).

3.2.2 Setting

Pietermaritzburg, the capital of South Africa's KwaZulu-Natal province, is located about 80 kilometres inland of the Indian Ocean coastline in an area known as the Midlands. After 1994, the city, its former townships, and surrounding rural areas were merged to form the new Msunduzi Municipality, which is home to some 600 000 residents (Msunduzi Municipality, 2008). Along with many other municipalities across the country, Msunduzi is struggling to maintain its existing infrastructure while also extending the provision of housing and basic services to those who lack them. The Baynespruit is wholly contained within the city's urban area, as shown in Figure 3.1. The main stream and its smaller tributaries arise in the Northdale and Raisethorpe residential areas north of the Pietermaritzburg Central Business District (CBD); the stream flows south through the Willowton Industrial Area (WIA)

and past formal and informal settlements west of Eastwood, then through the community of Sobantu before joining the main uMsunduzi river. The community of Sobantu was chosen as the focus of the residential stakeholders group, in part because they live downstream of all the other factors contributing to solid and liquid waste pollution, but also because they need to make use of the water for gardening and small-scale agriculture.

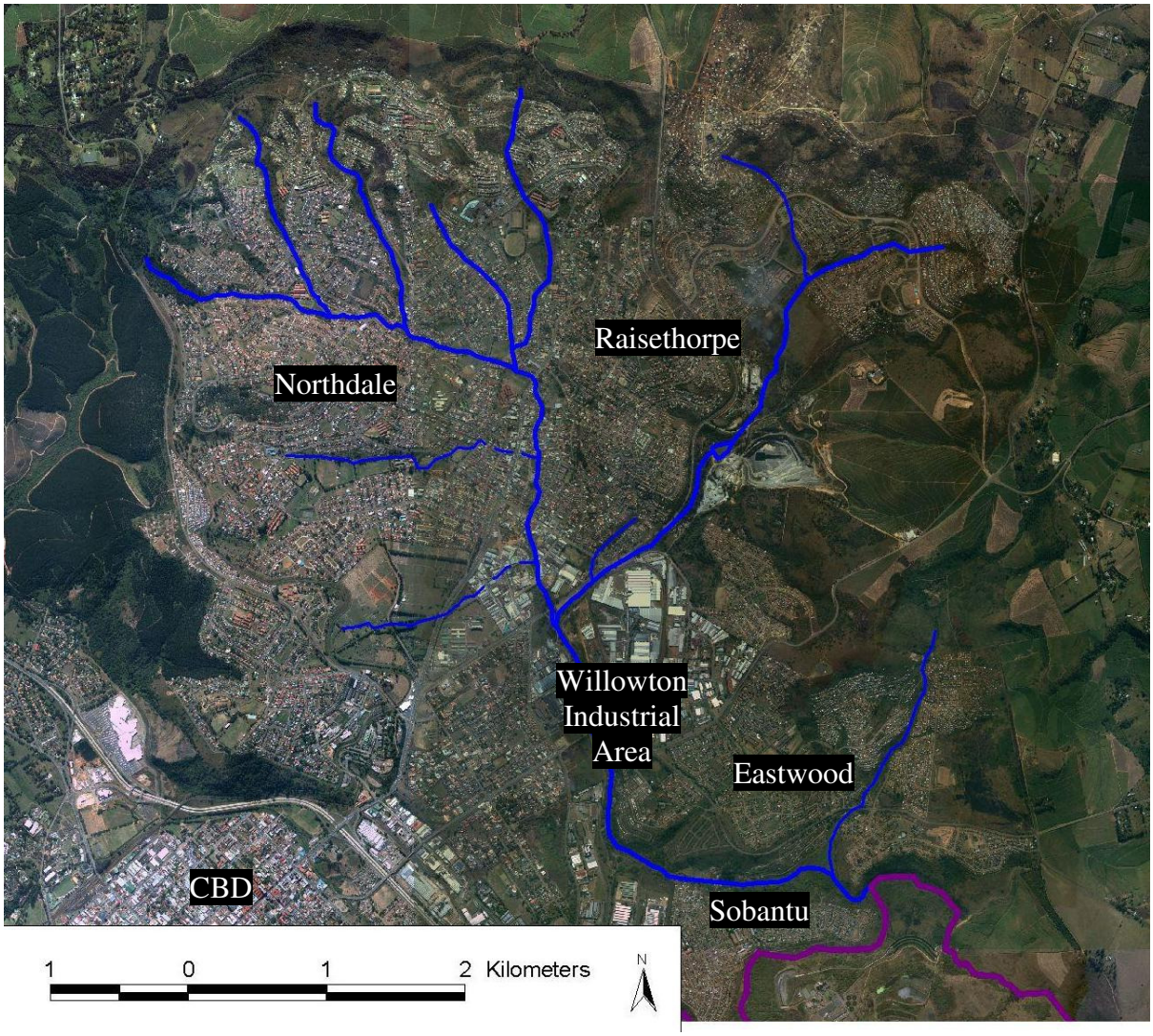

Figure 3.1: *Map of the Baynespruit catchment (uMsunduzi River in purple)*
Source: S. Terry, Umgeni Water (Aerial photo courtesy of Msunduzi Municipality, 2004)

While there is a lack of detailed demographic information specific to the Sobantu community, the most recent South African Census (Statistics SA, 2001) contains some useful data. At that time, Sobantu was grouped with the Lincoln Meade neighbourhood to the south as Ward 35; due to the fact that few (if any) black Africans lived in Lincoln Meade then, and that few (if any) non-black Africans live in Sobantu, the Sobantu community likely made up about 82% of the population of Ward 35 as a whole, as Africans made up 10 237 of the total

population of 12 532. Education levels had risen in the ward since the 1996 census, with 54% of residents having had at least some secondary education. However, only 53% of the total labour force was actually employed, with those jobs mainly being in the social services, manufacturing and retail sectors; more than 8 000 residents reported no monthly income, and a further 2 200 reported monthly incomes of R 1 600 or less. Despite these figures, 87% of residents lived in a formal dwelling (house), 88% of households used electricity for lighting, 92% reported weekly municipal refuse collection and 91% had a flush toilet (Statistics SA, 2001). However, given that some 18% of Ward 35 consisted of the middle-class residents of Lincoln Meade, and that the figures presented here are for the ward as a whole, the true unemployment and poverty figures for Sobantu are likely higher, while the education and municipal services-provision figures are probably lower.

The Msunduzi Municipality's Area-Based Management programme provides additional descriptive information about the Sobantu neighbourhood. According to the programme, homes in the area consist of two to four rooms, each with water and sewer connections, located along tarred roads. Sobantu has both a primary and a secondary school, a health clinic, a community hall, a sports field and a swimming pool. Founded in 1928, the tight-knit community's residents have a history of working together on projects such as agricultural development (Msunduzi Municipality, n.d.). The neighbourhood's ethnically homogenous population likely makes this task easier, as only 126 people in all of Ward 35 listed an African language other than isiZulu as the language they spoke most often at home (Statistics SA, 2001). In this atmosphere of collaboration, in early 2008 a number of local groups including the Sobantu Environment Desk Network 96 (SEDN96) and the Sikhuthele Community Club (formerly Community Farming Co-op 1) merged to form a new umbrella organisation, the Sobantu Environmental and Agricultural Forum (SEAF), to create a strong, united voice for the community. This is important, as not only are residents faced with water pollution in the Baynespruit, they and others downwind also contend with air pollution in the form of smoke from the nearby municipal landfill (Epprecht, 2006; Msunduzi Municipality, n.d.).

Many residents of Sobantu work at the factories in the nearby WIA (Msunduzi Municipality, n.d.), and they were among those affected by the steady decline in the footwear manufacturing industry. While the remaining industries offer employment possibilities for local residents, anecdotal evidence suggests that owners and management at the factories represent an entirely different constituency. Of the 24 companies located along the Baynespruit that were contacted by the Duzi-uMngeni Conservation Trust (DUCT), the majority of designated representatives (usually owners or quality/operations managers) were

roughly evenly split between those of European and Indian heritage. The companies themselves range in size from small to large; some are independent while others are subsidiaries of national or even multi-national operations. The factories manufacture a range of products, including carpets, chemicals, food and toilet paper, for both domestic consumption and export. From a water pollution perspective, “legal and illegal discharges from factories are a major problem ... on the Baynespruit tributary, which drains the Willowton Industrial area” (WRC, 2002: 20). The most contentious factories have historically been the four large edible oil, soap and candle manufacturers. As will be outlined in section 4.2.1, these industries have been reprimanded numerous times by regulatory agencies - the DWAF and Msunduzi Municipality - for effluent discharges to both the municipal sewer system and the stormwater drains which empty into the Baynespruit.

However, there have also been cases in which the local municipality itself has been threatened with legal action by the DWAF over its failure to comply with water quality standards. Two trunk sewer lines traverse parallel to the Baynespruit river, which drains a large urban and industrial catchment; problems here include blockages, old and/or redundant infrastructure in need of maintenance or replacement, siltation, illegal trade effluent discharges in the lower catchment and illegal stormwater connections to sewers in the upper catchment that contribute to sewer surges during storm events (Sivparsad, 2008). DWAF is not the only organisation drawing attention to these problems, though. Established in 2005 and registered as a non-profit organisation the following year, the DUCT is headquartered in Pietermaritzburg and focuses on the catchments of the uMsunduzi and uMngeni rivers, which eventually join before flowing to the ocean. Initially formed by a group of paddlers, its constituency includes other recreational watercourse users, farmers, and local communities who regularly use river water in the catchment area. Through a variety of funding and labour partnerships with individual volunteers, organisations and businesses, the DUCT coordinates activities such as cleaning up litter, removing alien invasive species, planting trees, reducing soil erosion, and implementing education and awareness campaigns. With working groups from Howick (25 kilometres northwest of Pietermaritzburg) to Durban (80 kilometres southeast of Pietermaritzburg, on the coast), the DUCT is able to ”assess, monitor and implement various projects to enhance river health along the length of the uMsunduzi and uMngeni rivers” (DUCT, 2008).

3.3 Research Methodology

This study made use of a qualitative, anti-positivist research methodology, in which subjective data were collected through quasi-participatory research. Participatory research “is related to the processes of conscientization and empowerment … [it] involves people

gaining an understanding of their situation, confidence, and an ability to change that situation" (Servaes & Arnst, 1999: 110). This style of research involves "a collaborative process that unites inquiry, education, and social action" (Friesen, 1999: 281). While this study was not undertaken by the affected parties themselves, it was conducted with the aim of facilitating effective stakeholder participation, thereby enhancing the chances of group action to address the problem of water pollution in the Baynespruit. The research was conceived and conducted in partnership with the DUCT, a local NGO, and was intended to contribute to the successful establishment of the Baynespruit Conservancy; it also had the interest and support of local residents from an early stage. It is thus mostly appropriately classed as a quasi-participatory case study.

3.3.1 Population and Sample Selection

This case study was limited to in-depth interviews with a small sample of 17 stakeholders directly affected by water pollution in the Baynespruit. This included those who live, work (in industry, for an agency or parastatal, or in small-scale agriculture) and play (undertaking recreational activities such as canoeing) along the Baynespruit or immediately downstream of its confluence with the uMsunduzi River. While all interviews were conducted with individuals, many were consciously presenting the perspective of a larger group, be it their community, company or agency. Appendix B lists the individuals interviewed and their affiliations.

Stake (1995: 56) asserts that case study researchers must make use of the "best persons, places, and occasions …[to] help us understand the case". Therefore, purposive (non-probability) sampling was used to select the interview subjects from among industry representatives, residents of Sobantu, local small-scale farmers and NGO representatives. Selection to achieve a representative sample made use of the knowledge and experience of elected officials, regulatory agency and parastatal staff, and members of NGOs. To account for non-responses, a greater number of interview subjects were identified than were actually required. The sampling criteria varied by category. Representatives from government agencies and parastatals were chosen based on their job description, with a focus on those who had been involved in addressing and/or monitoring some aspect of solid and/or liquid pollution in the Baynespruit. Representatives from industry were also chosen based on their job description, with interviews generally being conducted with operations and/or quality managers. In the case of local residents, small-scale farmers and NGO members, an attempt was made to choose a range of individuals representing different viewpoints (youth, elders, farmers and community activists).

3.3.2 Research Techniques

As suggested by Stake (1995) and Yin (1994), a number of different techniques mining a variety of sources of evidence were used to carry out this study.

***Table 3.1**: Techniques used and evidence collected to address research objectives*

Technique	Source of Evidence	Objectives Addressed
Semi-structured interview	Selected Stakeholders	• analysing past initiatives • understanding stakeholders' views • identifying barriers and incentives
Documentation	Local Newspapers	• analysing past initiatives • identifying barriers and incentives
Participant observation	Interaction with stakeholders	• understanding stakeholders' views • identifying barriers and incentives
Direct observation	Attendance at meetings among stakeholders	• understanding stakeholders' views • identifying barriers and incentives

As shown in Table 3.1, the main measuring instrument was a semi-structured interview, which is further explained in the following section. The interviews addressed each of the research sub-objectives, including analysing past initiatives that have addressed pollution in the Baynespruit, understanding stakeholders' views of the pollution problems and their effects, and identifying barriers and incentives to participation affecting each stakeholder group. To supplement the analysis of past initiatives, documentation in the form of articles on water pollution issues published in local newspapers between 1980 and 2001 (compiled by a former faculty member at the Centre for Environment, Agriculture and Development) were consulted; in addition, a few of the people involved in past initiatives were contacted and provided the researcher with information by telephone or e-mail. Finally, to better understand stakeholders' existing engagement and their views on the issues, both participant and direct observation were also used. Participant observation came in the form of conversations with representatives of the two dozen industries in the Baynespruit catchment (as their participation in the Baynespruit Conservancy was solicited) and at the inaugural meeting of the Conservancy at which key stakeholders gathered. Direct observation was primarily carried out via attendance at the quarterly meetings of the Msunduzi Catchment Management Forum (MCMF), but also at other meetings, such as one between the Sobantu community and municipal officials.

3.3.3 Measuring Instrument

As this was a qualitative case study, the measuring instrument was aimed at uncovering subjects' perspectives and motivations, rather than proving or disproving a research hypothesis. In this case, a semi-structured interview technique was used to achieve a better

understanding of stakeholders' views and experiences as well as the economic, situational, developmental and socio-cultural factors enhancing or hindering their ability to work with other parties to find solutions to common problems. Though interviews are time-consuming and run the risk of introducing researcher bias in interpreting responses (Monette *et al.*, 2002; Sewell, 1998), they offer far greater control and flexibility in terms of gathering the required information (Barriball & While, 1994; Monette *et al.*, 2002; Sewell, 1998). Not only are interviews ideally suited to uncovering what Stake (1995) terms the 'multiple realities' of how the issue is percieved by the different stakeholders, they also offer an opportunity for social interaction, which can add to the researcher's understanding (Barriball & While, 1994; Kelly, 1999). Semi-structured interviews in particular can be tailored to a varied group of respondents, such as the Baynespruit stakeholders, and are "well suited for the exploration of the perceptions and opinions of respondents regarding complex and sometimes sensitive issues and enable probing for more information and clarification of answers" (Barriball & While, 1994: 330). A set of interview questions was thus devised as the measuring instrument used to conduct this research, based on the procedure outlined in Figure 3.2.

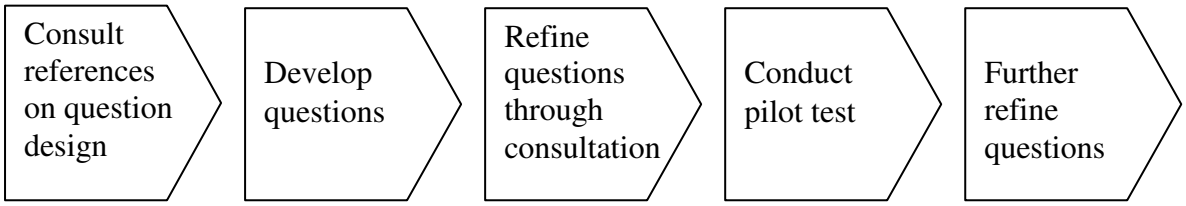

Figure 3.2: *Development of the interview questions*

While the interviews followed a structured set of questions, they were unstructured to the extent that follow-up questions were asked to invite respondents to expand on particular topics in order to deepen the researcher's understanding. The intention was to elicit information about both apparent and more implicit barriers and incentives to participation by asking both direct and open-ended questions. Open-ended questions are most useful when there are many possible responses and the researcher does not wish to restrict the subject's answer (Monette *et al.*, 2002), which was indeed the case in this study; furthermore, it was hoped that the use of open-ended questions would draw out the implicit reasoning behind respondents' thought-processes and uncover deeper meaning. Finally, a certain amount of redundancy was built into the questions, to both test respondents' consistency and allow them to elaborate on and/or emphasise important aspects. The interview questions were initially formulated by the researcher, and further refined in discussions with the research supervisor and staff at the DUCT. Pre-testing was conducted in a pilot study of five stakeholders, and the questions were subsequently refined; this is further discussed in section 3.6. As shown in Figure 3.3, the process of formulating questions, probing during

interviews and reflecting on the information gathered to date all contributed to deepening the researcher's understanding and beginning the process of interpretation and analysis.

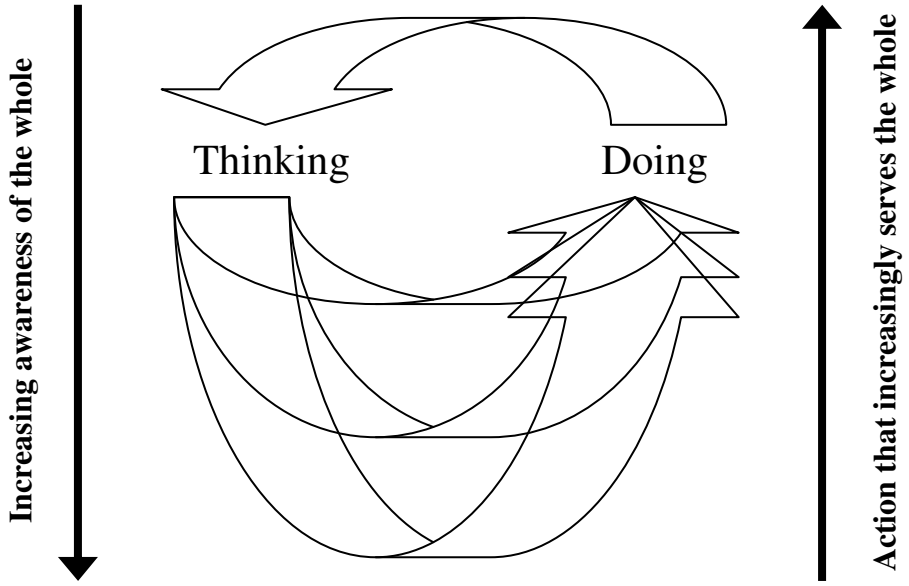

Figure 3.3: *Deeper Levels of Learning (create increasing awareness of the larger whole)*
Source: Senge *et al*., 2005: 11.

Prior to beginning the interview, the research was briefly re-explained to help put the respondent at ease (Leech, 2002). Introductory questions involved general, non-threatening queries to prompt the respondent to talk about his or her relationship to the Baynespruit and its impacts on his or her daily life; it was hoped that a good rapport and a relaxed atmosphere could be established by asking such questions first, as recommended by Kelly (1999), Leech (2002) and Monette *et al.* (2002). Subsequent questions probed for responses to address the research objectives more specifically. First, a series of questions were asked about the respondent's perception of the pollution in the river and how it affects him or her. The bulk of the remainder of the interview then focussed on multi-stakeholder processes, barriers and incentives to participation faced by the respondent, and his or her views on how the Baynespruit's pollution problems could be addressed. Finally, a few questions specific to the individual stakeholder groups (local residents and NGOs, industries, and regulatory agencies and parastatals) were posed. In general, questions were framed in terms of "what" or "how", rather than "why", to avoid defensiveness (Charmaz, 1991) or speculation by the respondent about the reasons for his or her actions or feelings (Kelly, 1999).

It was projected that the interviews would require approximately one hour to complete. While no audio recordings were made during the interviews, to avoid the possible distraction cited by Kelly (1999), detailed notes were taken on a laptop computer – verbatim, as much as

possible – in order to reduce interpretation and potential bias on the part of the researcher, as noted by Monette *et al.* (2002). All respondents were assured of anonymity; though some respondents stated that this was not necessary, it was of some concern to others, especially those who were speaking in an official capacity. Bradburn and Sudman (1979) found a positive correlation between complete confidentiality and respondents' willingness to answer sensitive questions, and it was hoped that anonymity would encourage more candid discussion during interviews. While the same authors found little effect from the presence of third parties in interviews conducted with adults (Bradburn & Sudman, 1979), interviews were conducted in a quiet, private setting as much as possible. Unfortunately interruptions were unavoidable in the few cases in which interviews were conducted in the subject's office.

3.4 Procedure

Once the research topic had been identified, a preliminary literature review was carried out and a research proposal drafted. Based on the tasks and timeline outlined therein, the study began with the development of the interview questions and the submission of an ethical clearance form to comply with university requirements. The next step was to identify and contact the interview subjects: in several cases, contact was made in person at a meeting of the MCMF; a preliminary introduction to the research was made to some residents of Sobantu through the local ward councillor, and this was followed by personal contact at a subsequent DUCT-SEAF meeting, or by telephone; industry representatives were contacted via an introductory letter and follow-up telephone call. Interviews were arranged for a time and place convenient to the respondent. One or two non-responses were encountered among stakeholders initially contacted in each of the groups, but none of the stakeholders with whom contact was established refused to be interviewed.

An initial pilot study of the measuring instrument was carried out, which resulted in a refinement of the interview technique. All interviews were conducted in Pietermaritzburg, generally at the subjects' workplaces, but occasionally at their homes or another convenient location. The objectives of the study were first explained to potential interview subjects, all of whom subsequently granted permission to conduct the interview. Subjects were described using biographical information to maintain anonymity. Though the option of conducting the interview in isiZulu (through an interpreter) was offered, only one respondent was not fully comfortable conducting the interview in English, and that subject elected to use a family member for assistance when translation was required. The researcher made detailed notes of subjects' responses on a laptop computer.

While interviews were being arranged and conducted, the literature review continued and the analysis of historical documentation and contact with knowledgeable individuals were also initiated. As data were collected, data interpretation and analysis began.

3.5 Data Interpretation and Analysis

The importance of the researcher as a factor in case study research is widely recognised as being greater than for most other research approaches (Stake, 1995; Tellis, 1997a; Yin, 1994). To reduce the subjectivity inherent in such studies, the researcher must approach each task with great thoroughness (Jocher, 2006), and always have the research questions in mind (Stake, 1995). In addition, Yin (1994) lists a number of requirements for an investigator to be successful in carrying out case study research, including extensive background knowledge of the issues, an unbiased and flexible approach, and the ability to ask the right questions, then listen carefully to – and correctly interpret – the answers. Once data collection is underway, both Jocher (2006) and Stake (1995) emphasise the value of clear and concise descriptions of all observations which may prove significant during later interpretation and the drawing of conclusions. Stake (1995) goes so far as to claim that recordings and/or notes made during interviews are less important than drafting a record of the interview and what he terms 'interpretive commentary' after the fact.

"Data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study. Analyzing case study evidence is especially difficult because the strategies and techniques have not been well defined in the past" (Yin, 1994: 102). In fact, it may not be possible to define them, as case studies commonly use what Monette *et al.* (2002) term 'narrative analysis'. In this qualitative analytical device, interviews and other data sources are used to create a detailed description, often making use of direct quotes from subjects. This direct interpretation of the various sources of evidence to identify trends, underlying thought processes and the reasons behind stakeholders' actions was used extensively in this case study. The goal was to achieve an understanding of the relationships within this particular social system, and the potential for various stakeholders to become fully involved in meaningful participation to reduce water pollution; it was hoped that this research would generate new insight in this regard. Thus one of the main analytical methods used was the recognition of patterns in the data, and the comparison of actual and predicted patterns as described by Stake (1995) and Yin (1994).

Though case study research is not focussed on categorising (Monette *et al.*, 2002), the raw data obtained from the interviews were nonetheless summarised to identify common elements within and among stakeholder groups, while taking demographics into account.

This was undertaken primarily through the use of coding, in which categories of responses were developed based on the data. According to the methods outlined by Monette *et al.* (2002), a combination of simple descriptive and more subjective interpretive codes were used to identify dominant themes in the data, with the coding moving from open (or unrestricted) methods initially, to focussed coding in which the data were organised into a more limited set of categories. This complemented the less structured analysis which was accomplished through reflection on the diverse information as it was gathered in increasing quantities; this reflection allowed for what Stake (1995) termed 'categorical aggregation', the accumulation of examples in order to make a statement about a particular group. Such continuous feedback between data collection and theory development can play a key role in qualitative data analysis (Monette *et al.*, 2002).

Barriers and incentives to participation were also categorised, for the purposes of this study, into one of four categories: economic, situational, developmental and socio-cultural. As noted in the literature review, different authors have classified barriers and incentives in a number of different ways. However, it was felt that these four categories would be useful to contrast the relative importance of the various barriers and incentives to different stakeholder groups, as displayed in Figure 3.4, with the arrow's width representing the magnitude of the influence of the given category.

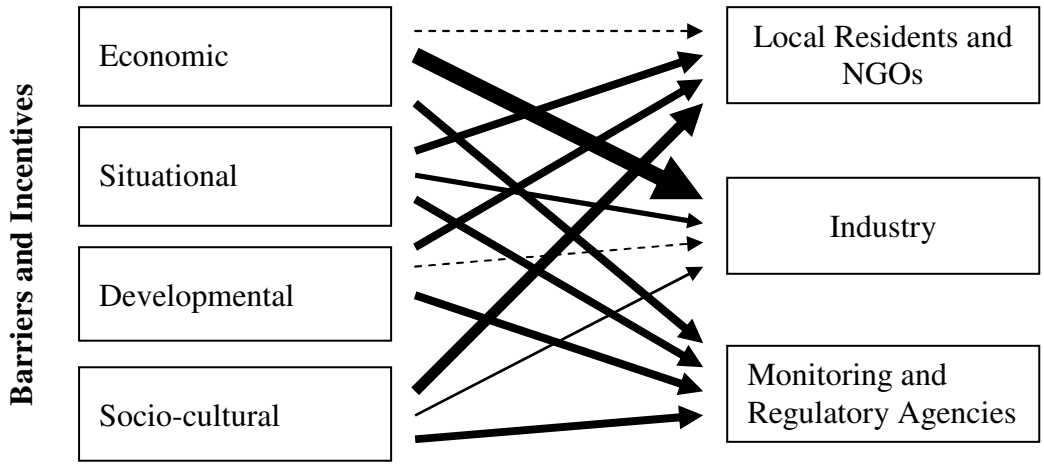

Figure 3.4: *Conceptualisation of the predicted relative importance of economic, situational, developmental and socio-cultural barriers and incentives.*

Economic barriers and incentives consisted of any financial or material costs or benefits, situational barriers and incentives of practicalities such as time considerations or living/working conditions, developmental barriers and incentives of knowledge and skills-related elements, and socio-cultural barriers and incentives of considerations such as power

inequity, recognition and values. It was initially theorised that each of these categories of barriers and incentives would play a greater or lesser role with respect to each stakeholder group, as shown in Figure 3.4.

3.6 Validity and Reliability

To ensure high quality research whose conclusions contribute to the body of knowledge on a particular topic, issues of validity and reliability must be addressed. This is particularly important in case study research, which has traditionally been perceived as lacking in some of these areas (Orum *et al.*, 1991; Riege, 2003; Yin, 1994). Construct, internal and external validity, as well as reliability, are each addressed in turn herein. As noted previously, one of the main threats to construct validity is the subjectivity inherent in case study research (Riege, 2003; Yin, 1994). Both Riege (2003) and Yin (1994) suggest using multiple sources when collecting evidence, as well as establishing a chain of evidence, including transcripts of interviews. In this study, data collected via a semi-structured interview technique were supplemented by the use of documentation, participant observation and direct observation; while records of interviews and other conversations were kept, more detailed notes likely should have been taken.

As descriptive case studies do not profess to determine causation, internal validity is not a major concern (Yin, 1994). With regard to external validity, a number of different approaches can be found in the literature. Case studies focus on analytical, rather than statistical, generalisation (Riege, 2003; Yin, 1994), and it is especially difficult to demonstrate external validity in a one-case study (Tellis, 1997b). Yin (1994: 36) recommends trying to "generalize a particular set of results to some broader theory", and this has been attempted in subsequent chapters of this study. However, Monette *et al.* (2002) note that when the goal is to provide a thorough contextualisation and understanding of a particular case, deriving generalisations from the data which can be applied to other cases is not of primary importance. Servaes and Arnst (1999) further state that participatory research, by its very nature, is focussed not on objectivity and external validity, but rather on the applicability of the research in assisting those under study, and therefore also on the wide distribution of the results among said subjects. So while the external validity of this study may not be high, it is nonetheless hoped that the research results will assist not only the Baynespruit Conservancy, but also other stakeholder-participation processes such as CMAs or other similar fora.

While qualitative research, in general, is less concerned than is quantitative research with ensuring that a study is replicable, reliability must be considered nevertheless. In case study

research, one of the main ways of ensuring reliability is the use of several different sources of data (Stake, 1995; Yin, 1994). As mentioned previously, this study did indeed use multiple sources of evidence; this allows for triangulation, in which information from one source is substantiated by information from other sources (Stake, 1995; Tellis, 1997b). Another way to increase reliability is through the development of a case study protocol to guide the researcher, which should include an overview of the project and its objectives, field procedures, research questions and a reporting plan (Yin, 1994). In this study, these elements were developed and presented as part of the initial project plan.

As the semi-structured interview technique played such a key role in this research, it merits separate discussion. One of the main ways of reducing threats to the reliability of interview data, based on a researcher's bias or level of skill and/or the effectiveness of the questions themselves, involves conducting a pilot test (Appleton, 1995; Barriball & While, 1994; Welman *et al*., 2005). In this research, a pilot study was conducted in which the interview questions were pre-tested on a small group of respondents. To increase the research validity and reliability, these preliminary results were used to adapt the research design. The pilot study involved two residents and farmers in Sobantu, two representatives of regulatory agencies and parastatals, and an elected municipal official. While the pilot study did not uncover any new or surprising issues not previously identified in background reading material, it did reveal a difference in perception among stakeholders between those who felt that industrial pollution was the most important problem and those who cited sewer surcharges and human waste contamination as the greater concern. It was also found that due to staff and volunteer turnover, key players from past initiatives were no longer available to shed light on the goals and difficulties involved. Perhaps due to miscommunication, some people who were identified as important players proved to have been only peripherally involved.

The major weakness in the measuring instrument highlighted by the pilot study was in the area of identifying barriers and incentives to participation. This was identified through evaluation of interview subjects' responses with the research supervisor. While the existing questions were efficient at eliciting information about obvious barriers and incentives, mainly situational considerations such as logistics, they were not successful at drawing out underlying issues. Some of the questions were thus modified and/or added to, and additional follow-up questions were asked to elicit more implicit issues. Another factor was that the time required proved to vary with the interview subjects. Residents and farmers tended to be more direct in answering questions and therefore required an hour or less to cover all responses, while regulatory agency and parastatal staff often added background information

or covered the same ground more than once as subsequent questions focussed on ideas they had already mentioned in another context.

The fact that the stakeholders interviewed varied widely in their demographic profiles must be considered. Barriball and While (1994: 330) note that in such cases "validity and reliability depend, not upon the repeated use of the same words in each question, but upon conveying equivalence of meaning". Indeed, the questions were sometimes adapted to suit an individual, and the pilot study assisted the researcher in developing alternative phrasing to express certain questions. Moreover, researchers have noted differences in responses given when a respondent's race, religion or gender, for example, differs from that of the interviewer (Barriball & While, 1994; Monette *et al.*, 2002). It is impossible to ignore this as a factor in this research, as at least one (and often all three) of these differences were present in all but one of the interviews conducted.

3.7 Summary

This chapter began with a description of the research design, including a discussion of the case study approach and the setting in which the study was conducted. It then focussed more specifically on the research methodology followed, including how subjects were selected from the target populations, the variety of research techniques employed, and the primary measuring instrument, a semi-structured interview. Following a description of the research procedure, the data interpretation and analysis process was outlined, and issues of validity and reliability were addressed. With the research framework described, Chapter 4 presents the data compiled, and discusses it with respect to the different stakeholder groups' views of the problem as well as the barriers and incentives they experience.

Chapter 4: Results and Discussion

4.1 Introduction

With case studies, "there is no particular moment when data analysis begins. Analysis is a matter of giving meaning to first impressions as well as to final compilations" (Stake, 1995: 71). This chapter synthesises and discusses the results of this ongoing process. It begins by framing the present situation within its historical context, and gleaning information from past initiatives to address pollution in the Baynespruit. It goes on to present stakeholders' views of the problem, which vary substantially by group, though certain truths are widely acknowledged. The final sections discuss the findings with respect to the barriers and incentives to stakeholder participation. The actual results differed somewhat from expectations formed by consulting the literature, in some cases due to circumstances particular to this case.

4.2 History of Pollution and Remediation Efforts in the Baynespruit

" …the pollution in that stream is more than 20 years old. The problem started when [the landfill refused to accept] the liquid [effluent] from the factories in the 1980s, they started pumping into the river. Before that, it was a clean river … full of fish."

This observation was made by a long-time resident of Sobantu and member of the SEAF. Not only does it provide a timeline over which to view the problem, it is also a reminder of what the Baynespruit once was – and could be again. While extremely high levels of sewage and the widespread dumping of garbage, along with alien invasive plants, are undoubtedly contributing to the degradation of the stream, this statement traces the worst pollution to industrial effluent from the WIA, which is further documented in the following section. The development of the WIA was not accidental. The original idea was to provide employment opportunities, especially for black Africans – hence the location of a major industrial area in close proximity to Sobantu, among other areas (Epprecht, 2006). During the 1980s, though, unemployment rates among black Africans in the Pietermaritzburg area remained high, at approximately 30%; despite the fact that their preferential location meant that residents of Sobantu enjoyed substantially higher employment levels than did people in other communities, uprisings against the apartheid political system continued (Gwala, 1989). The city thus began encouraging more indiscriminate industrial development, almost doubling the number of factories during the latter half of the 1980s, resulting in "dramatic increases in pollution" (Epprecht, 2006: 4).

Not unexpectedly, the first media reports of industrial pollution resulting in legal action by the government appear during this time. A collection of articles from the local newspapers

written about water quality issues, compiled between 1980 and 2001 and housed at the Centre for Environment, Agriculture and Development at the University of KwaZulu-Natal, provided a detailed historical record of major water pollution incidents and the initiatives to address them. The following sections summarise what was reported with relevance to the Baynespruit, with additional commentary from other sources. Unfortunately the loss of key players, who have moved away or are otherwise no longer available, made it difficult to ascertain what became of some of the initiatives discussed.

4.2.1 Documented Water Pollution

On April 25, 1990, it was reported in the *Natal Witness* that the Department of Water Affairs (DWA) had charged Willowton Oil and Cake Mills with water pollution under Section 21 of the *Water Act* (Witness Reporter, 1990). On May 3, a follow-up report indicated that the company had been found guilty of having "unlawfully discharged effluent in excess of the permitted standard prescribed from its premises in July 1988". A lawyer for the company stated that the problem had likely been the result of overflows due to a pump failure or severe storm, and that more than R 100 000 had since been spent on designing a new system. However, the prosecution noted that rainfall records did not indicate any storm activity at the time and that improvements made by the company had not yet been agreed by the DWA (Urquhart, 1990). Later that month, it was reported that Willowton Oil and Cake Mills' discharge levels for chemical oxygen demand (COD) had been close to 4 000 milligrams per litre (compared with a standard of 75), and levels for suspended matter had reached 598 (compared with a standard of 25). Furthermore, despite a fine of R 5 000, Umgeni Water suspected the company of continued pollution, and noted that the Baynespruit "has already lost almost all of its fish and plant life as a result of repeated pollution" (Weinberg, 1990: 3).

Industrial pollution of the Baynespruit by the large oil and wax factories came to a head in the latter part of 1992. On September 24 and December 14 of that year, advocates for Sea Lake Industries were in court to defend against charges that the company failed to purify its water and industrial effluent prior to discharging it; COD readings in excess of 4 400 had been found in samples taken on February 21, 1991 (Amla, 1992a; Witness Reporter, 1992a). On December 2, following the dumping of "more than 10 tonnes of vegetable oil and soap waste [which] clogged up the Darvill Sewage Works", it was reported that the city council had decided to seal off sewer access for any factories illegally dumping waste into the municipal sewerage system. Additionally, the DWA decided to issue both Sea Lake Industries and Willowton Oil and Cake Mills with water permits that would commit them to compliance or face more serious violations under the *Water Act*, which at the time carried

penalties of up to R 100 000 (Quinlan, 1992). Two weeks later, with no improvement having been found following monitoring of industrial effluent discharges, city council decided to brick up sewer access at Capital Oil Mills, Sea Lake Industries, and Willowton Oil and Cake Mills (Witness Reporter, 1992b). This was undertaken on December 18, but a couple of days later large quantities of effluent were discovered in the Baynespruit; the alleged source was Sea Lake Industries' stormwater pipes, leading a city councillor to call for a consumer boycott of their products (Aitcheson, 1992). During this period, the DWA regional water quality manager went so far as to suggest that he could "apply to the Minister of Water Affairs to reduce or suspend the water supply to the factories" (Aitcheson & Hornby, 1992: 1).

In July of 1993, it was alleged that Willowton Oil and Cake Mills had built a brick wall to connect their stormwater drain with the sewer system, thus allowing effluent to bypass Umgeni Water's sampling point (Nichols, 1993). In November of that same year, at the ongoing trial of one of the directors of Sea Lake Industries, chemists from Umgeni Water testified that vegetable oil from the company had polluted the Baynespruit in both February and May of 1991 (Court Reporter, 1993). However, due to inadequacies in the sampling and analysis procedures followed during water testing undertaken at the time, both the company and its director were eventually acquitted (Witness Reporter, 1996a). An undated report noted that Capital Oil Mills had been charged with "unlawfully depositing unpurified industrial effluent containing high levels of oxygen, chemical oxygen and grease to be discharged via a stormwater drain into the [Baynespruit] in July 1993" (Anon, n.d.). A subsequent report in May of 1996 noted that the firm had paid an 'admission of guilt' fine of R 300 for having discharged oil directly into the sewer system the previous year (Witness Reporter, 1996b). This token amount was agreed because the company threatened to go into liquidation, and municipal officials were apparently less worried about environmental damage than about industrial closures or re-locations, which would create unemployment (Epprecht, 2006). Capital Oil Mills was back in the news less than a year later, when staff at Umgeni Water pinpointed the factory's stormwater drain as the source of effluent discharged into the Baynespruit (Dell, 1997). The charges stemming from the 1993 pollution incident were eventually withdrawn after the company went into provisional liquidation in 1998 (Witness Reporter, 1998).

On July 28, 1994, an article in the *Witness* reported yet another incident of industrial oil waste being illegally dumped into the sewer system (Pillay, 1994). Later that year, while a rail tanker was being offloaded at Capital Oil Mills, an accident resulted in some 5 000 litres of oil being spilled into the Baynespruit; while company employees managed to recover some of it, oil covered the surface of the water and an official at Umgeni Water predicted that

this, along with the resulting bacterial digestion which depletes oxygen levels, would result in a fish kill (Munusamy, 1994). After a period of relative quiet, Sea Lake Industries was back in the news in 1999 following a boiler explosion. The incident prompted media coverage documenting not only the company's record of unsafe practices, but also its history of releasing industrial effluent into both the municipal sewer system and the Baynespruit (O'Grady, 1999).

It was not only discharges from industry causing degradation of the Baynespruit, though. In November of 1991, Pietermaritzburg city council was warned of impending prosecution for failing to address frequent and significant faecal pollution of the uMsunduzi river, primarily caused by overflows from the Darvill treatment plant during heavy rain events; at the time, the contamination problems were attributed to stormwater infiltration into ageing sewers, illegal connections, blockages and informal settlement areas with inadequate sanitation (Grimbeek, 1991; Leftwich, 1991a). More than 15 years later, however, the DWAF is once again using the threat of prosecution under the NWA to push what is now the Msunduzi Municipality into dealing with polluted local rivers, including the Baynespruit. Problems continue to be blamed on blocked drains, leaky pipes, illegal structures and connections to the sewer system, and a lack of municipal sanitation and refuse collection service provision (Denny-Dimitriou, 2008a). Chief among the contributing factors are high rates of water infiltration into sewers; though an estimated 300 kilometres of old pipes are in need replacement, only two kilometres of the sewer network is replaced per year (Denny-Dimitriou, 2008b).

In late 1993, a senior scientist at Umgeni Water stated that industrial effluent and human sewage discharged into the Baynespruit had created "one of the most seriously polluted stretches of water in this part of Natal" (Quinlan, 1993: 1). With *E. coli* counts of close to 2 million per 100 ml at times (compared with a health hazard threshold of 10 000) and a biotic index of between 0 and 5 (compared with 80 – 200 for healthy rivers), he described the water course as almost devoid of both oxygen and life; a spokesperson for the DWA said that they were working with Umgeni Water to identify the source of the pollution (Quinlan, 1993). The next decade did not bring appreciable change, though. By 2001, Umgeni Water's *Annual Sustainability Report* noted that "serious pollution incidents in the Baynespruit … has over the years resulted in the poor health status of the river. The Sobantu community has been mostly affected by this pollution as the high *E. coli* counts make the river unsafe for full contact recreation. Effluent discharges have also killed many fish and have resulted in blockage of the irrigation systems that the community use to irrigate their vegetable gardens" (Umgeni Water, 2002: 42).

4.2.2 Past Education and Pollution Reduction Initiatives

In the late 1980s, when industrial effluent discharges into the Baynespruit were first being reported, sewage pollution was being recognised as a major problem affecting the larger uMsunduzi catchment. At an April 5, 1991 symposium held by the Pietermaritzburg city council and Umgeni Water to address sewage pollution in the uMsunduzi river, community organisations – of which those in Sobantu were specifically mentioned – were encouraged to participate in making recommendations (Leftwich, 1991b). Later that year, the head of the Institute for Natural Resources (INR) was tasked by local government bodies and NGOs with forming a committee composed of representation from all interested parties to bring an end to pollution in the uMsunduzi and uMgeni catchments. They envisaged a forum through which people could voice concerns about development and resource conservation issues and receive practical environmental management assistance (Leftwich, 1991c). Unfortunately it is not known what, if anything, become of these initiatives. In late 1991, an organisation called the River Action Campaign (RAC) was formed by experts in water-related fields from local government, parastatals and NGOs. Early the following year, the RAC began a programme to train community groups, schools and other interested parties on how to monitor water quality using basic kits to test for indicators such as acidity, dissolved oxygen and the presence of certain nymphs; they also encouraged groups to 'adopt' a particular section of a water course (Amla, 1992b; Banfield, 1992). The programme was apparently well-received, with a number of schools signing up for workshops (Witness Reporter, 1992c), but nothing further was reported and during this study it was not possible to find anyone who recalls the initiative.

With regard to the Baynespruit in particular, despite the recognition of extreme levels of pollution throughout the 1990s, it was not until late in the decade that the problem received some specific attention. Epprecht (2006) suggests that this may have been due to lingering bitterness on the part of white municipal leaders, who were not inclined to tackle an environmental problem that only affected black African neighbourhoods – particularly those, like Sobantu, whose residents had exerted considerable political pressure prior to the fall of the apartheid regime. Whatever the reason, the first public protest was part of a Keep Pietermaritzburg Clean Association (KPCA) march held on September 14, 2001, at which members of the Sobantu Environmental Desk Network 96 (SEDN96) presented a memorandum to the mayor of Pietermaritzburg and a representative from the Pietermaritzburg Chamber of Commerce and Industry (PCCI). The memo noted that the ongoing pollution of the Baynespruit by certain industries in the WIA "has serious economic, health and recreational implications for members of the Sobantu community", and called on

the PCCI and its member industries to deal with the problem. While pointing out that not all industries located in the WIA were PCCI members, the PCCI representative promised a "swift response" (Witness Reporter, 2001a: 3). At a subsequent meeting held between the companies and other stakeholders by the PCCI environmental committee, representatives from industry agreed to ensure that their factories did not negatively affect the water course (Pole, 2002). It does not appear that any binding commitments were made, but this initiative may have been overtaken by the subsequent formation of the Baynespruit Task Team, described later in this section.

In this same period during which attention was being focussed on the Baynespruit, a number of stakeholders, including SEDN96, the KPCA, and industries in the WIA, organised a Baynespruit Clean-up Campaign to address another issue of concern: garbage; it was held on November 29, 2001 (Witness Reporter, 2001b). Perhaps not surprisingly, during the clean-up participants came across an apparent case of active industrial pollution which Umgeni Water was called in to investigate. In response, a representative of Willowton Oil and Cake Mills insisted that "the few industries that continue to act recklessly and pollute the Baynespruit … rectify the situation immediately" and that the authorities "ensure that the offending industries be ruthlessly pursued in order to clean up their acts". He also promised "the people of Sobantu Village that we will make every effort to ensure that our stretch [of the Baynespruit] is kept clean" (Witness Reporter, 2001b: 3).

Also as a result of a SEDN96 appeal, the Msunduzi Catchment Management Forum (MCMF) proposed the establishment of the Baynespruit Task Team (BTT) in 2001 (Pole, 2002). The goal was to identify illegal discharges and trace them back to specific firms (Pole, 2008). However this undertaking was (and is) especially complicated in the WIA, where an interconnected network of sewer and stormwater pipes makes identifying sources of illegal discharges difficult (Epprecht, 2006; Pole, 2002). At the municipality's behest, representatives from industry were included on the BTT, which meant that "the investigated thus became part of the team of investigators" (Pole, 2008). Nonetheless, according to numerous participants, from industry to local residents, the BTT was successful in eliminating industrial discharges for a period of several months. Unfortunately, with the problem 'solved' the pressure relented, the Task Team became inactive, and discharges of industrial effluent into the Baynespruit soon resumed.

To understand why none of these initiatives achieved lasting success, one might begin by examining the stakeholders involved, the stated goals of the efforts and the difficulties they encountered. Each of these attempts to address pollution was to some degree initiated or

guided by government and parastatals, particularly at the local level. NGOs, in the form of residents' groups and other associations of concerned citizens and specialists, were also responsible for instigating and carrying out awareness-raising and remediation. While industry does not appear to have led any of the endeavours, their representatives, and in some cases staff, took part. In addition, the goals of each initiative, be they awareness-raising or pollution reduction, were fairly clearly stated. However, with the possible exception of the BTT, stakeholders do not appear to have engaged in a participatory process to jointly negotiate long-term solutions. In fact, some stakeholders do not appear to have had any involvement beyond the identification of the problem (such as SEDN96's memorandum), or one-time participation (such as the factory employees and local residents who removed litter as part of the Clean-up Campaign). Residents of Sobantu in particular seem to have been excluded from any direct negotiation and subsequent activity, in some cases just hoping that highlighting the issue would bring change. Comments such as those of the following three respondents illustrate this:

"… we had a march and there was no response … we were so many … we got placards and went with schoolchildren down to City Hall. They promised to [look into the matter], but we didn't see anything."

"… we thought the councillor would speak to the factories and we thought the factories would respond by not polluting"

"We got comments in the newspaper, but there was no response from the municipality. There were some fines, but we were not informed about them."

In some cases partnerships among stakeholders were developed, such as the one between the SEAF and the INR during the establishment of small-scale agricultural plots near Sobantu, but communication remained problematic. According to one member of the SEAF, the INR produced a report that identified the sources of the effluent discharges that were preventing the use of water from the Baynespruit for irrigation, but the SEAF never received a copy. Though changes in community leadership since that time make it difficult to determine, part of the impetus for the formation of the SEAF may have been communication breakdown within Sobantu's own (at that time diverse) network of environment-focussed groups. Without feedback, residents and leaders who were concerned about the issues would not have been able to continue to focus public and political attention.

The BTT, which had participation from the DWAF, Msunduzi Municipality, Umgeni Water, industries and the community – and benefitted from funding from an overseas NGO – came closest to being a participatory process. Ghai and Vivian (1992: 10) emphasised "the importance of building multi-class alliances in the pursuit of environmental objectives, and …

the critical role played by technical knowledge [and] participatory research … in understanding and finding solutions to environmental problems." Indeed, the BTT enjoyed what one industry representative felt had been "open communication" among the varied stakeholders, as industries were shown the effects of effluent pollution on the ecosystem and downstream communities, and the authorities stepped up their monitoring activities. While this does not quite equate with participatory learning, a representative from Umgeni Water judged that some companies did make lasting improvements. Others did not change, though, and ultimately the BTT foundered. According to two industry representatives who sat on the Task Team:

"I don't think the goals were met … it just fell away eventually because there was a lack of commitment from other stakeholders."

"The Baynespruit had actually recuperated, but it didn't last long. The committee stopped meeting and there was no more action."

The key ingredient which, by its absence, prevented the BTT from being a truly participatory process was the lack of any redistribution of power among stakeholders. The community of Sobantu does not appear to have wielded any ability to influence, much less control, decision-making and outcomes, and no other interested and affected parties (such as NGOs or other downstream users) were represented. However, the short-term success of the increased monitoring and response to pollution incidents by Umgeni Water and the municipality during the period in which the BTT was active indicates that this is a key component in motivating industry. Eventually, many of the BTT's members became part of the MCMF; as has been noted previously, though, this forum has little representation from industry. Regrettably, the ultimate failure of any of these initiatives to bring about lasting change was a significant discouragement to local residents. As one member of the SEAF lamented:

" … all the campaigns and talking to the factories were in vain, because they carried on polluting"

4.3 Stakeholders' views of the problem

To determine how the diverse stakeholder groups would approach a multi-stakeholder process, it was critical to begin by understanding what they saw as the major pollution issues and their effects, and the importance they attached to these problems. In general, respondents identified industrial pollution as being the most significant problem, and the impact of pollution on human health as the greatest concern. Otherwise there was substantial variation among, though not as much within, the stakeholder groups. Local residents and NGO members, as well as regulatory agency and parastatal staff, both placed

greater value on clean and healthy water courses than did industry representatives, noting, for example:

"In certain parts of the catchment, [riparian areas are] the only green space left"

"The environment is the foundation … water plays a vital role in everyone's lives, so that's why the Baynespruit is a major concern."

Predictably, local residents and NGO representatives who interact most closely with the stream felt the effects of pollution most keenly. Perhaps this accounts for the fact that all the local residents interviewed used to word "dirty" to describe the stream, while only one other stakeholder did. The following is a representative statement:

"The river water is dirty, fish are dying … it's dangerous to go into the water because of the cans, pollution, etc. [Contamination from informal] settlements [has] made the water very unhealthy."

With regard to responsibility, attitudes varied widely among stakeholders. Agency staff largely felt a duty to contribute as much as possible to finding solutions, viewing it as part of their job and role in the community. Local residents tended to view themselves as victims of externally-generated pollution, though they acknowledged their own community's role in exacerbating the garbage problem. Nonetheless, many were willing to accept some responsibility for assisting with pollution reduction. On the other hand, industrial representatives generally felt that the problems should be addressed by local government. They did not see themselves as deriving any benefit from the stream, and some did not feel any custodial connection to it at all. When asked whether or not he was concerned about the fate of the Baynespruit, one respondent said that he was no more concerned with the state of the stream than with the condition of the local road. Municipal staff members are apparently aware of such attitudes, with one noting that:

"There seems to be no recognition from industry as to the importance of these [riparian] systems."

4.3.1 Local Residents and NGOs

All residents of Sobantu reported that the stream was part of their daily lives in some way. Farmers and those tending vegetable gardens were most connected with the stream, and had a detailed knowledge of the pollution issues, as did the representative of the NGO DUCT, who was not a local resident. While all subjects identified the industries as a major cause of water pollution, most also recognised sewage contamination and the dumping of garbage as important issues; one resident felt that the sewer surcharges had actually become of greater concern than discharges of industrial effluent. Others noted that some

people living in Sobantu and neighbouring communities use the river or the floodplain to dispose of their rubbish if they miss the weekly collection, or if they can not afford plastic bags for disposal. One respondent pointed out that there are also vehicle maintenance garages in the area that dump used oil and other waste products into the Baynespruit. The DUCT representative also mentioned the infestation of alien invasive plants.

All respondents were concerned about the effects of the various sources of pollution on human health in general, and some residents specifically questioned the impacts of using water from the Baynespruit to irrigate produce, which is consumed both by those who grow it and by other local residents who buy it. It is a concern shared by many in the developing world: some 200 million people living in urban areas, especially in Africa and Asia, eat produce grown locally using untreated waste water (Anon, 2008). One subject noted that many in the community are living with illnesses such as HIV/AIDS, so their health is already compromised. For members of the DUCT (many of whom make use of the uMsunduzi river downstream of its confluence with the Baynespruit for paddling) health, particularly from the perspective of high *E. coli* counts, was a major concern. Most residents also mentioned issues of recreation, with children either no longer able to swim in the river, or risking their health by doing so. Food security was raised, both in terms of fishing, which is no longer possible, and agriculture. Local food security had been a focus of the original small-scale farming Co-op begun in the 1990s, but one respondent reported that since 2005, when farmers suspended all use of water from the Baynespruit (which they had been gradually forced to reduce due to pollution), they have been unable to cultivate more than half their allotments due to a lack of water. One community representative noted that this problem also affects a similar agricultural project in nearby Eastwood. Despite the many impacts, effluent and sewage pollution events are not continuous but sporadic, which may account for the respondents who were concerned that many community members are not aware of the hazards posed by the use of water from the Baynespruit for things such as recreation and irrigation. Finally, the gradual social degeneration which results when natural areas become degraded was pointed out by two respondents. The following comments capture residents' and NGO members' views on pollution and its effects:

"[We] depend on the cleanliness of that river, that is why I'm very concerned"

"It's dirty … they put everything [in the Baynespruit] - oil, plastic, urine, bottles …"

" … a young boy swam in the river and his skin became dry and damaged with spots"

" … when people come to buy [vegetables such as spinach and beetroot], they see the river and don't want to buy because they know we use the water to irrigate"

"Community food security is badly affected because they used to fish there …"

" … people retreat when public spaces become degraded … It starts with weeds, then comes rubbish, then criminals start hanging out there."

One of the most interesting commonalities was that most people interviewed had been raised in the community and talked about the changes in the Baynespruit over the years, something not noted among the other stakeholder groups who did not have an equally long-term association with the stream. Local residents were thus the only ones to speak of the stream as the healthy ecosystem it used to be a generation ago; agency and industry stakeholders apparently have no recollection of this. Two long-time residents expressed it this way:

" …it used to be a recreation area, we used to go there in summer for swimming … we used to go fishing for sport and in summer for food when there were big fish. There was bird life as well …"

" … the value of the stream for fish, swimming, to look at a beautiful river running - that is gone now."

With respect to how they would begin addressing the pollution problems, most residents expressed a preference for some kind of multi-stakeholder forum. They felt the only possible approach was to have representatives from the factories and the communities along the stream sit down together with officials from the municipality and discuss the effects of the pollution and try to understand each other's problems. It must be noted that this majority view does not stem from a particular faith in the participatory process, but rather from having exhausted all other options. Though one resident held a dissenting view, saying that the community would come together to fight and perhaps take the factories to court again, most realised that strategies such as protests, one-off media attention and legal action had not brought about significant and lasting change in the past. They expressed a preference for dialogue, backed up by close monitoring:

"… I can see that the law cannot solve these problems"

"Previously we tried strategies like picketing, but now we want to try a multi-stakeholder forum, and also form a monitoring group to make it easy to pick up the problems."

"The best thing may be to invite the factory owners to come to Sobantu and … discuss the effects on the people who use that water."

Perhaps due to a greater sense of empowerment and a shorter history of engagement and disillusionment with the Baynespruit's pollution issues, the DUCT representative saw greater

potential for the use of proactive, coordinated action and publicity in putting pressure on all parties to act, saying:

"We need to start doing something ourselves … The public [must] express mounting concern, which would lead to coordinated private actions, which would then leverage municipal actions to be stricter on pollution, dumping, etc."

4.3.2 Industry

The most striking comment, made by all respondents from industry, was that their firms derived no benefit from the Baynespruit, despite the fact that all sites had stormwater drains which emptied into the stream and many employed people who lived downstream. This perception may be due to the fact that industries in the WIA do not extract water from the stream, but use the municipal supply. Two industry representatives admitted to never having actually visited the stream. The following comments summarised the lack of connection:

"It's not a priority issue … we only have a stormwater drain."

"We don't hear anything from them [the community] … They [impacts of pollution] don't affect us."

" ...people in Sobantu draw their water directly from the stream, so we're affecting people downstream. [Industries] don't seem to realize that."

Most did, however, express general concern for the state of the stream, from an ecological as well as a human health perspective. Two respondents made specific mention of their companies' concern for the quality of the stormwater they discharge, and the measures they have in place to ensure that effluent does not pollute the stream. Interestingly, knowledge of the stream and its problems was considerably higher among representatives of the edible oil companies – which are typically regarded as the main sources of effluent pollution – than among other companies' respondents. This was likely influenced in part by the fact that those interviewed at the edible oil companies had worked for their companies for considerably longer than the majority of those interviewed at other firms, but perhaps also as a consequence of their long history of interaction with the authorities regarding pollution. One respondent tactfully put it thus:

"We've been dealing with the stream, disposal of liquid waste, for quite some time with the municipality."

In general, industry representatives identified industrial effluent as the main problem affecting the Baynespruit, followed by garbage (both household and industrial); only one respondent mentioned sewage as a concern. The most common suggestions they made on how to address the pollution problems involved companies taking responsibility for their

effluent, along with more stringent enforcement of the law, as well as education for residents regarding pollution issues. With respect to who needs to be involved in contending with pollution, company representatives named themselves and other industries along with government agencies, including the municipality; most also included residents. The following comments summarise the most widely-held views:

"Social responsibility on the part of the businesses along the river … [and] education of the residents would also go a long way to solving the problem."

"The municipality and Umgeni Water also don't take the initiative to monitor industries … We need more stringent [enforcement]."

"Obviously the community need to be there, industry in the area, a regulatory body like DWAF or Umgeni Water, the municipality …"

4.3.3 Regulatory Agencies and Parastatals

Knowledge of the stream and the problems affecting it among staff at regulatory agencies and parastatals was high. This stakeholder group also had the most holistic view of the water course as part of larger ecological and human systems. All respondents expressed considerable concern for the pollution in the Baynespruit, and most of the local government and parastatal agencies' staff members specifically mentioned taking a personal interest in its condition. This may be due in part to the fact that many of these respondents are the ones taking calls from frustrated members of the public who want pollution problems dealt with. According to one:

"I want to know that I've done my best … I become labelled as not doing enough, so it's important to me that we solve these issues."

The representatives from regulatory agencies and parastatals identified illegal industrial discharges as the most problematic contributing factors, but also pointed the finger at residential sources of pollution, lack of service provision to settlements, ageing sewer infrastructure, population increases and greater density, and misuse of the sewer network resulting in blockages and surcharges. Human health was chief among the impacts recognised, but respondents also mentioned environmental health, erosion, damage to infrastructure, the creation of conditions under which pests such as mosquitoes, rats and cockroaches flourish, unpleasant smells, and problems for downstream users both small and large. Typical comments included the following:

"It affects the fauna and flora on the banks [and] water quality … it feeds into the Duzi which is also impacted … downstream it feeds into other dams, [which] causes problems when water has to be purified for consumption."

"Clearly it's a health issue primarily, but it goes beyond that. It affects livelihoods, unemployment levels are high and … people are being denied [the] opportunity [to] … undertake urban agriculture [to make] an income, and [to access] fresh vegetables."

Agency staff members were encouraged by progress, whether it was better maintenance of infrastructure or building capacity among residents. However, they noted that much still needed to be done. Given their comprehensive understanding of the Baynespruit system and the sources and effects of pollution, respondents were surprisingly narrow in their suggested solutions. Most recommended education and awareness-raising for residents, and some felt that industry should also be approached in this way. A number of respondents said that more resources would be required, whether to maintain and replace infrastructure, increase monitoring, carry out community capacity-building or take legal action. One municipal representative's experience was that the most effective approach was to make an example of one offender, and then wield the threat of prosecution to spur others into action:

"You need to put money, resources and expertise into prosecution – support and dialogue will not be encouraged until someone has been smacked."

Only two respondents mentioned involving the full range of stakeholders in finding solutions, from regulatory agencies to community leaders, heads of industry and relevant specialists. Both expressed quite practical views, but one arrived at this opinion after years of disappointment:

"Decision-makers definitely need to be involved …"

"Policing daily won't help [due to] corruption, applying the law doesn't work, so it must be more voluntary, people must communicate [with the polluters]."

4.4 Barriers to Participation

Though an apparent lack of forthrightness from industry representatives undoubtedly hindered the analysis, economic barriers seemed to play a dominant role across all stakeholder groups. Other barriers to participation differed among categories, with situational barriers of greater importance to industry as well as regulatory agencies and parastatals, while developmental and socio-cultural factors were more significant for local residents and NGO members. The majority of respondents from all stakeholder groups would limit their involvement if a participatory process was not producing results and fellow stakeholders were uncooperative. The following comment summarises this attitude:

"If there were no clear targets and objectives, if it degenerated into a talk shop, a blaming session [I would not participate]. People must accept responsibility for dealing with their issues."

Another commonality was that all stakeholders tended to think at a very local level, which is not particularly surprising given the current regulatory framework. Other than the respondents from Umgeni Water and the DUCT, who are concerned with water quality in the entire uMsunduzi-uMngeni watershed, none of the interview subjects seemed to look beyond the immediate Baynespruit system boundaries. Only two respondents – both agency staff members – mentioned CMAs, but if and when they are implemented regionally, stakeholders will be forced to think about the issues on a larger scale. This will be particularly true with regard to downstream impacts, likely an unwelcome change for industry, but a possible benefit to local residents and NGOs. A related barrier discouraging proactive residents and industry representatives was the lack of response from authorities, resulting in a loss of faith in their ability to carry out their duties. The following comments were made by industry representatives and a local resident:

"We don't get any information about the condition of the stream … even though we're right here."

" … most of the time when we complain, nothing happens, there's no action."

"What bothers me is getting no response from the authorities when you actually see an incident."

While monitoring and enforcement are unquestionably the obligation of the regulatory agencies, other stakeholders – for a variety of reasons which are further examined in subsequent sections – have a tendency to thrust all responsibility for action onto them. This was on display at the inaugural meeting of the Baynespruit Conservancy, at which the Chair of the DUCT had to remind the audience of the importance of being proactive. As one municipal staff member who was interviewed pointed out:

"[Some] are suggesting that the municipality should be the one dealing with the problem, but the river is the responsibility of everyone who lives on its banks."

4.4.1 Local Residents and NGOs

It was anticipated that a variety of developmental, situational and socio-cultural factors would prevent participation on the part of residents of Sobantu and members of NGOs. Such barriers could range from a lack of knowledge and empowerment, to meetings held at inaccessible locations or inconvenient times (for example, during the work day). However, though one respondent mentioned that evening meetings were difficult as everyone was tired by then, situational barriers appeared to play a negligible role. While Griffin (1999), Negra (1998) and Wandersman *et al*. (1987) all found lack of time to be a significant barrier to citizen participation – and this was indeed the case for the DUCT representative – it was

not a factor mentioned by local residents. Nonetheless, respondents were not willing to devote time to initiatives that failed to make progress and lead to action, as found by Griffin (1999), Prestby *et al*. (1990) and Wandersman *et al*. (1987) and demonstrated in these responses:

"If I don't get data and information [feedback] from participation, it's useless … Also, if I don't see action plans in place, then what's the use?"

"If it's going to be a talk-shop, then no [I wouldn't participate]."

Though financial considerations are rarely raised in the literature, they proved to be a significant barrier for the residents and NGOs interviewed. The most common concern among residents was a lack of transportation to attend meetings, while for the DUCT it was a lack of staff – both issues which come down to economics. Part of the problem appears to stem from the lack of a 'culture of volunteerism' in South Africa, with people either expecting to be paid for their time or to receive some material reward: this was made abundantly clear during the DUCT's Community River Care Day, at which most participants were either company employees, or were anticipating a T-shirt and a free meal in return for a morning's work helping to clean up litter along local water courses. While Everatt *et al*. (2005: 284-5) found that 17% of South Africans volunteered their time, with black Africans and Indians much more likely than coloureds and whites to do so, they noted that a large proportion of giving consisted of "informal social caring and neighborly support [through] HIV/AIDS home-based care initiatives, stokvels, and burial societies", causes which often involve extended family or direct self-interest. In the event that citizens do wish to implement improvement projects of their own initiative, though, economic resources still present a barrier. A local resident and an elected official described both situations in their comments:

" … if you get no profit, it's discouraging … so I need some money [for transport and time]"

"The main thing that stops people is financial constraints. They have a bright idea, but how do you put it forward … [for example, they lack] money for brush-cutters, bags for garbage clean-up … It's discouraging to people … as time goes on, you give up."

As the DUCT representative points out, though, if citizens are committed to working toward change, action can be facilitated:

"There is funding out there that's not being accessed … We could link [stakeholders] with other initiatives, funding, etc."

In essence, then, the DUCT has knowledge of projects and sources of funding which local residents are either unaware of or unable to access. Warner (2006) terms such problems

'structural inequalities'. Prestby *et al*. (1990: 146) suggest that government agencies, foundations and other organisations should be instrumental in decreasing the "inhibiting costs of participation", which may include not only material goods such as the supplies mentioned by the municipal official, but also "information, training resources, and public recognition". In order for them to do so, they must be made aware of affected communities and their needs, and this is where networking becomes so important. As one official pointed out, *"you need a good communicator to tap community outreach funding"*. In reality the SEAF has already begun to benefit from the opportunities that making contacts can afford, in one case through resources accessed via members' participation in the MCMF.

Several respondents also pointed to developmental barriers, generally a lack of knowledge and skills, as something that could prevent them from participating. The Global Water Partnership (2000) suggests that governments take responsibility for providing education, reliable information and confidence-building mechanisms, especially for marginalised individuals, in order to facilitate and enhance stakeholders' ability to participate. In fact, training, including leadership development, has been used extensively in India to assist women and low-caste representatives (Gaventa & Valderrama, 1999). However, when government is not willing or able, networking may again assist local residents in getting access to suitable information and training. In Ecuador, successful grassroots organisations were found to have been supported by NGOs, churches and fellow community-based groups (Mitlin, 2004). In the case of formal processes, if capacity-building is seen as one of the aims of participation – as envisaged by Beierle and Cayford (2002), for example – then this developmental barrier should in fact be recognised at the outset and approached as an opportunity. After all, "the learning process can instill confidence and ultimately empowerment" (Servaes & Arnst, 1999: 124). However, for this to be successful the perceived experts must avoid being condescending, stifling innovative thinking, or providing insufficient information and/or training to allow participants to address the issue at hand – all problems documented by Arnstein (1969). Though one Canadian study found that it could take several years for lay citizens to gain the confidence and abilities required to make decisions about complex topics such as health care, it was certainly possible for them to do so (Singer, 1995). "Provided citizens are given a conducive and supportive structure for discourse, they are able to understand and process technical information and to articulate well-balanced recommendations" (Renn *et al*., 1993: 209). One agency staff member felt that developing knowledge and skills among local residents was vital in the case of pollution in the Baynespruit, and a local resident concurred:

"… community members [need to be involved], to be given the information and means … so they can know enough to report problems and be a part of the solution"

"I think it would help us to get a group to be trained to inspect the water, I think university students who are doing work on the environment [could] come and help us, I think that will play a big role in bringing ideas of how to go about cleaning the river."

Even just raising awareness about the problems and impacts can begin to change attitudes. One long-time resident described the following process of awakening in the early 1990s:

"[As workers in a nearby carpentry shop], we saw the river change colour every day, we said it was none of our business. When the Sobantu [environmental] organisation started, they heard about the pollution and thought it should be clean."

One of the major barriers to citizen participation discussed in the literature is a lack of empowerment, especially among the disadvantaged. As one resident of Sobantu stated at an initial meeting between the DUCT and the SEAF to discuss the Baynespruit, *"It looks like we are powerless"*. In their case, this may be compounded by the legacy of learned dependency examined by Servaes and Arnst (1999), in which solutions are expected to come from outsiders, as they often did during the apartheid era, for example. While residents may be willing to contribute, they apparently lack the confidence to instigate measures themselves. Ethnicity, gender and class may also contribute to power imbalances (Berkes, 2004); at the inaugural meeting of the Baynespruit Conservancy, despite an overwhelming majority of attendees being residents of Sobantu, only three contributed to the discussion, while half a dozen agency and industry representatives (all white or Indian males) dominated the proceedings. One must be cautious about ascribing this reticence to speak in front of a large group solely to demographic factors, however. It is possible that residents, whose first language is isiZulu, were not able to fully understand the discussion, which was held in English and exacerbated by noise and poor acoustics: this same problem was encountered by members of the SEAF when a subsequent meeting of the MCMF was held in the same venue. Perhaps more importantly, as Lozare (1994) points out, merely providing previously disempowered individuals with the chance to contribute to decision-making does not mean that they will be able to take advantage of this opportunity, as empowerment is not only a requirement but also an outcome of participation. When residents do take advantage of an opportunity to make their voice heard, though, they may find themselves marginalised. The following comments highlight these various problems:

"We wait for people to do something for us."

"I'll be happy if a campaign or NGO can participate in cleaning the river, maybe that would help us as neighbours in using the river … I would volunteer to [assist]."

"With politicians, if they don't know you they may not listen."

"Sometimes [municipal] staff don't attend the committee meetings [in Sobantu], as they don't think it's important."

"I know most of those factory owners … [but] when I asked them for some donations, they said they needed to have a meeting, but then they didn't turn up."

One way for citizens, especially those who are disadvantaged, to overcome power inequities is to build partnerships in order to learn effective advocacy and gain access to resources (Cornwall, 2004; Gaventa & Valderrama, 1999). Vivian (1992: 70) listed the "ability to form a coalition with regional, national or international groups which have similar interests, and to publicize their grievances and their cause" as one of the key characteristics of successful environmental activism. Mitlin (2004) sees an even broader role for what she calls national and international 'federating' among local groups, including developing members' knowledge, skills and confidence, learning what has worked elsewhere, and mobilising political pressure. In addition, Hamann and Acutt (2003) suggest that citizens strengthen their position by informing themselves about all the options available to them, including legal action, before they agree to negotiations. If one does not recognise the effectiveness or know how to make use of strategies such as press coverage, consumer pressure, or partnering with larger NGOs, it is not possible to exploit them. Some community members do in fact seem aware of the potential political power they could leverage, but do not appear to have taken full advantage of it:

"A lot of people [in Sobantu] are working in the factories [that discharge effluent in the WIA], … they need to talk to them [employers]."

"I don't think as one person I can influence decisions, but if we have the masses, we have a stronger voice."

As Wheeler (1999) points out, though, unskilled employees in particular put themselves at risk when approaching their companies' management, as they may have limited job options, and high unemployment means that others are only too willing to replace them. Organising willing co-workers to present a united front, using a non-confrontational approach, and taking action as part of a larger campaign can minimise such risks. Egger and Majeres (1992) stress the importance of coming together to push for common interests such as the enforcement of existing legislation and the creation of new policies. Overall, the general level of empowerment ranged from minimal to moderate among residents of Sobantu, but none were as confident in their ability to influence the decision-making process as the DUCT representative, who felt that it was indeed possible to do so using strategies such as:

"… lobbying, attending meetings, seeing people, writing letters, talking to council, [and] making people aware of the problems."

Finally, other socio-cultural barriers mentioned by local residents and NGO members related to the nature of the participatory environment, including the group dynamics cited by Prestby *et al*. (1990) and Wandersman *et al*. (1987), in addition to the importance of the perception of fairness noted by Smith and McDonough (2001).

"I need someone to encourage me to carry on, so I won't give up."

"If no one else is willing to help carry the load, it would drain us and we can't afford that. We want local stakeholders to take the initiative."

"… if I think there's bribery or corruption that would prevent me [from participating]"

Local residents and NGOs are thus affected by all four categories of barriers. The particular factors affecting this stakeholder group can be represented graphically as shown in Figure 4.1.

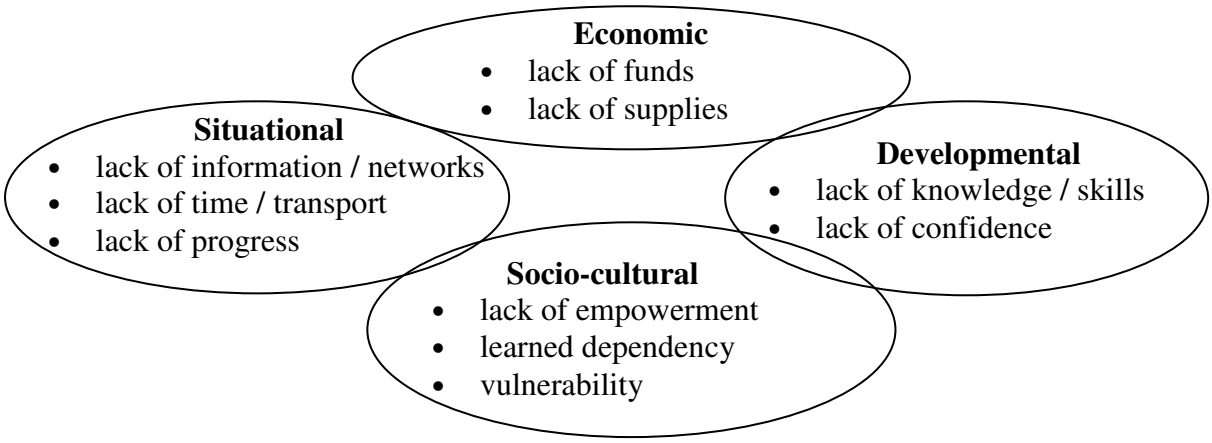

***Figure 4.1**: Economic, situational, developmental and socio-cultural barriers facing local residents and NGO members.*

Overall, the barriers to participation among residents of Sobantu and members of NGOs interviewed as part of this study differed somewhat from initial expectations. As summarised in Figure 4.1, economic factors played a larger role than anticipated, while situational barriers were less significant. Developmental impediments also existed, but were overshadowed by socio-cultural barriers, particularly a lack of empowerment. Fortunately, all of these barriers can be addressed, at least to some degree, by building relationships and contacts in order to facilitate access to both tangible and intangible resources.

4.4.2 Industry

For industry, the expectation was that economic and situational barriers, the latter primarily in the form of resistance to change, would play the largest role in determining participation in pollution reduction initiatives. Unfortunately, despite the guarantee of anonymity, discussions with other knowledgeable stakeholders and field observations indicated that some respondents may not have been completely forthright during the interviews. In fact, the most telling comment with regard to economic barriers came not from an industry representative, but from a regulatory agency staff member who had tried to work cooperatively with industries in the WIA:

" … compliance [with trade effluent by-laws] would involve capital injection, and arguments happened. So [although] we gave them advice and told them how to go about it … the money factor to initiate the controls was the stumbling block."

Notwithstanding the lack of candour from respondents, which in itself presents a barrier to constructive participation, some informative observations may be made. While it was difficult to asses an entire company's approach to organisational change over the course of a single interview with one representative, certain statements were indicative. For example, one company claimed to have dealt with their effluent discharge problems by halting the process responsible for its generation, not a particularly innovative solution. Those companies that had, or were working toward, VEAs such as ISO 14000 certification seemed somewhat more proactive in their approach to environmental challenges. Two such respondents replied that:

"We first look at environmental impacts for new products … from a health and safety as well as an environmental point of view … We [also] look for alternatives."

"We try to run an environmentally responsible programme … we salvage and re-use excess."

Some respondents also cited situational barriers, such as the timing of meetings, which could prevent them from participating, while others mentioned a lack of action or progress toward stated goals as a barrier to participation.

"More talking and less doing is pointless … [we] must have … action"

"[If] whatever measures are put in place are not enforced … if there's no improvement because other stakeholders are not doing their part [it could prevent our participation]."

Most responded positively to the idea of a multi-stakeholder forum, though, with the following comments being typical:

"Community is a big part of what we do, so if it's something we could contribute to, then by all means we'd get involved."

"If there was a clean-up day, we could budget funds, make resources available."

However, despite their statements, these respondents – along with the majority of the two dozen industries contacted with regard to participating in the Baynespruit Conservancy – did not attend the brief inaugural meeting or take advantage of the invitation to participate in the DUCT-organised Community River Care Day clean-up. There are a number of possible reasons for this. For those industries that are not generally thought of as polluters, it may be a simple lack of recognition that environmental health and justice issues are part of their corporate mandate (Hamann & Acutt, 2003). Despite their proximity to the stream, their stormwater discharge pipes and, in many cases, their employees being downstream residents, many industry representatives displayed a decided lack of concern for the Baynespruit. Others put the onus on regulatory agencies, or implied that water quality would not matter as much if people were not making direct use of it. Companies in the WIA are certainly not alone in adopting the former stance: no less a figure than billionaire American investor Warren Buffet dismissed native protesters alleging environmental degradation by one of his companies, "saying the issue was for regulators to resolve" (Clark, 2008: 42). The following statements capture the range of sentiments expressed:

"I would have to be convinced that the Baynespruit was my problem [before getting involved]."

"Whether we contribute to pollution or not … whether or not we have a major impact on the problem [is a factor]."

"For the residents it's a big issue, I'd hate to live on the banks of a polluted river. But there are so many concerns, like poor roads … we can't just focus on the river."

"If the informal settlement wasn't there, people would not be drawing water directly."

"… the local municipality should initiate the [clean-up] programme – they have funding through taxpayers' money."

"If Umgeni Water is not screaming, then things must be getting better."

When asked how the company keeps abreast of issues affecting the local communities, one respondent whose employees did not live in the area said simply, "*It doesn't affect us*". These companies seem to be searching for reasons to avoid getting involved. Some industries in the WIA actively resist engagement by regulatory agencies, let alone other stakeholders (MCMF, 2007). This may be done to avoid being blamed for pollution problems, and having to shoulder the consequences of taking responsibility, such as being asked to make commitments. Borrini-Feyerabend *et al*. (2004: 61) note that "a powerful way to maintain an inequitable status quo may be simply never to allow a meeting and organised

discussion to happen". More passively, such companies may simply be deterred from sending a representative to attend any gathering addressing the problems. The following comment from one resident of Sobantu made it clear why: "*We're going to fight until we have them [the factories]*". While such attitudes are clearly not conducive to productive dialogue among stakeholders, continued lack of engagement by industry is only likely to worsen relations.

Another disincentive to participation, discussed by Afsah *et al*. (1997), is the lack of enforcement. Companies may threaten bankruptcy or relocation to obtain leniency, regulatory agencies may not have the resources required to carry out rigorous monitoring, corruption may allow companies to avoid penalties, and unsuccessful prosecutions may lead to an unwillingness on the part of regulatory agencies to litigate in the future. All of the foregoing have been factors in the WIA (Pole, 2002). If there is no threat of being caught and/or prosecuted, companies have no motivation to change. A municipal official highlighted the problem thus:

"Enforcement is difficult because you can't catch the culprit … they [factories] discharge [effluent] at night."

Should industries indeed be involved in any form of corruption, the transparency required by participation would be a further barrier (Wang *et al*., 2004). A similar, though not illegal, phenomenon which is also anathema to transparency is what Bansal and Roth (2000) called 'field cohesion', in which firms in heavily-scrutinised industries, such as petro-chemical companies, tend to stick together. With four of South Africa's 17 edible oil refineries located in Pietermaritzburg (Pillay, 1994) a level of field cohesion was expected. Interestingly, though, the opposite proved to be the case: not only was there no loyalty between companies, but in one case there was actually finger-pointing. The overall importance of the three categories of barriers affecting industry are shown in Figure 4.2.

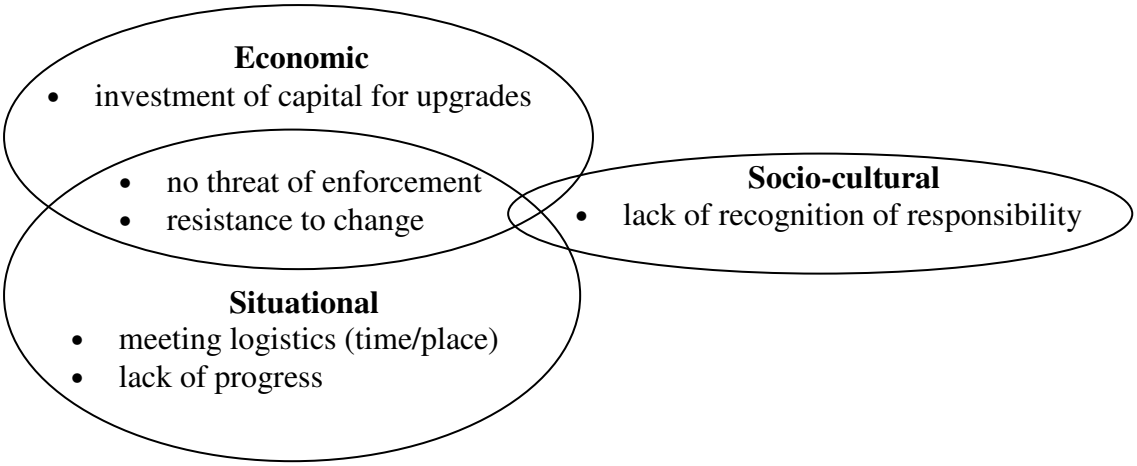

***Figure 4.2**: Economic, situational and socio-cultural barriers facing industry.*

On the whole, while certain purely logistical barriers were mentioned, resistance to change (both in the status quo and in organisational terms) as well as little threat of enforcement, combined both economic and situational elements. As predicted, developmental and socio-cultural barriers were of limited importance.

4.4.3 Regulatory Agencies and Parastatals

Based on the literature, the prediction for regulatory agencies and parastatals was that economic, situational and to some extent socio-cultural barriers would limit participation in reducing pollution. Indeed, a lack of resources, principally staff time and equipment, was cited by every respondent. Two also cited a lack of support from management-level decision-makers as limiting their efforts to contribute, and another noted that agencies are reluctant to participate unless other stakeholders take equal responsibility. Typical comments included the following:

"To participate effectively, we ... have to have more resources ... we can't always attend meetings due to time constraints"

"Umgeni Water is limited in what they sample … monitoring is only done during working hours and you don't know what they [industries in the WIA] have discharged."

"In part, more resources must be thrown at the problem, in order to empower the community [and to] do better monitoring and follow-up on sewer problems, industrial pollution (including the legal apparatus) …"

"You highlight the problems but the senior management doesn't buy in … people have other priorities."

" … [some] people … expect the municipality to drive the whole process, which has never succeeded … The ones that have succeeded have been chaired by the community… and the municipality is just a member"

Despite the fact that participatory governance is entrenched in South African legislation from the Constitution onward, regulatory agency and parastatal representatives had not had any experience with devolving authority to multi-stakeholder fora; it was thus difficult to judge whether this ceding of power would act as a barrier, as postulated by Involve (2005) and Servaes and Arnst (1999). It may well be an issue, though, as apparently even coordination within and among regulatory agencies and parastatals themselves is not perfect. According to these respondents:

"There's a lack of internal communication about new programmes, they're not always at our fingertips."

"In Pietermaritzburg, [we] need better cooperation between the municipality and Umgeni Water".

This is especially problematic because as one respondent pointed out, Umgeni Water does the bulk of the water quality monitoring on local water courses, but does not have a legal mandate to carry out any enforcement. In addition, regulatory agencies and parastatals are concerned about being held liable for defamation, especially if data collection procedures are contested. One respondent noted that the Pietermaritzburg air quality forum had looked into publishing data that *"would allow people to read between the lines"*, but monitoring standards were not determined to be high enough for complete confidence. Past unsuccessful attempts at prosecution have also created a reluctance on the part of regulatory agencies to try this route again, reinforcing the findings of Pole (2002) discussed in the preceding section. In addition, some staff members have been subjected to physical intimidation, an obvious barrier to involvement. According to these respondents:

"Information disclosure is not effective for industries … If you tell retailers or consumers about the situation with a supplier, you get slapped with a libel case."

"A colleague disclosed information to a retailer [about a supplier], and had a legal threat made against him."

"… the industries are very hostile to us [agency staff] … It's quite a volatile environment, and the threat is that it becomes personal."

In such cases, agencies could decide to publicise the results for those companies which are in compliance, rather than 'naming and shaming' the polluters, and allow the public to draw the logical conclusions (Dent, 2008). One respondent suggested that *"enforceable legislation that has been tried and tested"* would also help. Another respondent noted that information disclosure can be effective in getting governments to address their own pollution problems, but high-profile media attention does not seem to have brought enough pressure to bear to change the serious sewage contamination problems in Msunduzi Municipality. However, one

respondent (who was not a municipal employee) noted that *"sewage is being addressed … the municipality has a plan"*. Figure 4.3 summarises the barriers, which combine elements from different categories, hindering participation by regulatory agencies and parastatals.

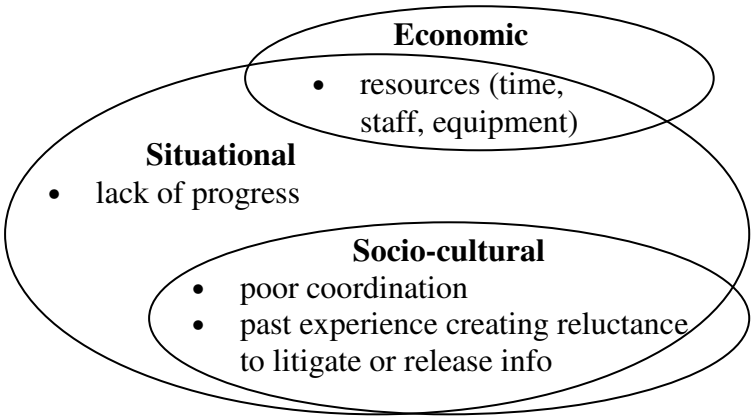

Figure 4.3*: Economic, situational and socio-cultural barriers facing regulatory agencies and parastatals.*

In general, economic and situational barriers, particularly a lack of resources for outreach and effective monitoring, and were the most significant barriers faced by regulatory agencies and parastatals. Developmental barriers did not appear to play a role, but some factors combined both situational and socio-cultural elements, in terms of inter- and intra-agency coordination and an aversion to methods such as data disclosure and prosecution of offenders.

4.5 Incentives to Participate

As was the case with barriers to participation, economic incentives were important to all stakeholders. Situational incentives were related less to logistics than to a desire to see an improvement in the future, especially among local residents and NGOs, as well as regulatory agencies and parastatals. Developmental factors were largely limited to local residents wishing to learn new knowledge and skills. Socio-cultural incentives played a significant role among local residents, regulatory agencies and parastatals, but the findings for industry were mixed.

The differences in motivation among groups were stark. While industry was largely motivated by external factors, such as the requirements of corporate customers or publicity, other stakeholders wished to see recovery of the stream. The contrast, especially between local residents who rely on the Baynespruit, and industry who only use it for disposal, was made apparent by one resident who stated simply, *"I need it to be clean"*. Another local resident expressed their sentiments thus:

"I think [multi-stakeholder participation] is our last hope. It was in my mind before that the law has tried its best and failed … we've got to try and form the structures that will include the factories, so that we understand each other … I hope that the solution is possible [with] everyone around the table."

Common ground was found among respondents from all stakeholder groups who would be encouraged to participate by an initiative that goes beyond meetings to actually accomplish something. The following comments were representative:

"If the results of a programme are tangible, that would encourage us."

"If a group is doing something concrete and positive, with real action and progress, then it's worth getting involved in."

4.5.1 Local Residents and NGOs

It was theorised that for local residents and NGO members, socio-cultural incentives would be of greatest importance, followed by developmental and situational factors. However, economic incentives proved to be significant. Prestby *et al*. (1990: 146) wrote that incentives may take "the form of supplies, education, skills, and social recognition", thereby including material goods, but not payment as hoped for by a majority of residents in Sobantu. While this discrepancy may be attributed to the fact that much of the literature focussed on citizens in developed countries, other reasons, as discussed with respect to barriers in section 4.4.1, are unique to South Africa. However, Renn *et al*. (1993) documented the case of citizens who sat on government panels established in the then-West Germany during the 1970s: those who were not formally employed were paid a fee for their time. The following comments were typical of local residents' thoughts on financial or material reward:

"I think it could open doors … and assist my community with employment … Creating employment is important."

" … maybe when there are special jobs like testing the water, if they can just employ … people … like us. If there's an opportunity for a temporary income [it would make it easier for me to participate]."

"Usually when we have environmental activities, we ask for T-shirts or water bottle sponsorship …"

For residents of Sobantu, it was anticipated that logistical incentives may come in the form of English-isiZulu translation at meetings, accessible and neutral meeting locations, or the provision of transport and child-care, as suggested by Involve (2005) and Warner (2006). Indeed, transport and local venues were mentioned by more than one respondent, but a more important situational incentive was the opportunity to contribute to change and assist the community, as documented by Burke (1968) and Mullen and Allison (1999). For local

residents, this is not just about personal satisfaction, but can be critical to their future well-being. “Poor people are by definition asset-poor, and are therefore highly dependent on public or common resources” (Egger & Majeres, 1992: 320), such as the Baynespruit. This was highlighted by the following representative comments:

“I don’t like what they’re doing [polluting the stream], and one day my grandchildren will go there.”

“I would participate because it affects me … if I can get the chance to [help clean up the stream] and make it possible, I’ll be there.”

“ … that stream is supposed to provide a living income for me and others.”

Developmental incentives were also mentioned by a majority of local residents, with representative statements included below. While some hoped they would have the chance to learn knowledge and skills as discussed by Irvin and Stansbury (2004) and Prestby *et al*. (1990), one respondent envisioned contributing personal expertise and experience, as noted by Involve (2005) and Negra (1998). The same respondent pointed out the benefits of participatory learning:

“I want to be informed.”

“I would want to gain skills, learn more about environmental issues … [this could] help us to educate our community and our children.”

“I believe I have knowledge and coordination skills, so those can be my contributions.”

“When I was still young, when we started the environmental club … we used to do some water testing in the river. I obtained some skills, and those assisted me in developing my understanding [and] getting to where I am today.”

The most important incentives, mentioned by all respondents, were socio-cultural. Chief among them was the opportunity to communicate and forge links with other stakeholders, or at the very least to have their voices heard. Though in the short-term the participatory process may not lead to the agreement of ‘mutual responsibilities’ among stakeholders as envisioned by Egger and Majeres (1992), it can at least help marginalised residents to develop their network of contacts. The expectation that nothing will change is an obvious disincentive for all those who wish to see improvements in the condition of the Baynespruit, especially local residents and NGOs. On the other hand, the feeling that they have the power to make a difference could be a strong incentive; stakeholders may require resources such as accessible information and the ability to network at the regional and national levels in order to achieve this. As one respondent put it, *“We need people with power on our side”*. Aside from using existing connections to reach influential individuals, simply knowing “where

to go and who to ask" for information (Negra, 1998: 30) is critical to effective participation. In her survey of local Conservation Commissions in the American states of Vermont and New Hampshire, Negra (1998) found that members relied on each other, civil servants, and their own and other members' professional contacts when they needed additional information. Developing these contacts can be a real incentive and an ongoing benefit. As the final comment in the following selection of respondents' thoughts shows, local residents and NGOs are indeed making use of some such networks.

"A multi-stakeholder forum is a place where the community can represent themselves … we can generate ideas on how to solve our problems together."

"If people are made aware of the community around the river, they'll think twice about polluting."

"Now, everybody is aware of the pollution, everybody is prepared to take actions to restore the river, that's encouraging me a lot. I can see the solutions can be found."

They [community members] report discharges to me, and I work with … Umgeni Water [to] … follow-up.

For local residents and NGO members, incentives to participate were similar in their distribution to barriers, as represented by Figure 4.4. Economic, situational, developmental and socio-cultural incentives were all of roughly equal importance.

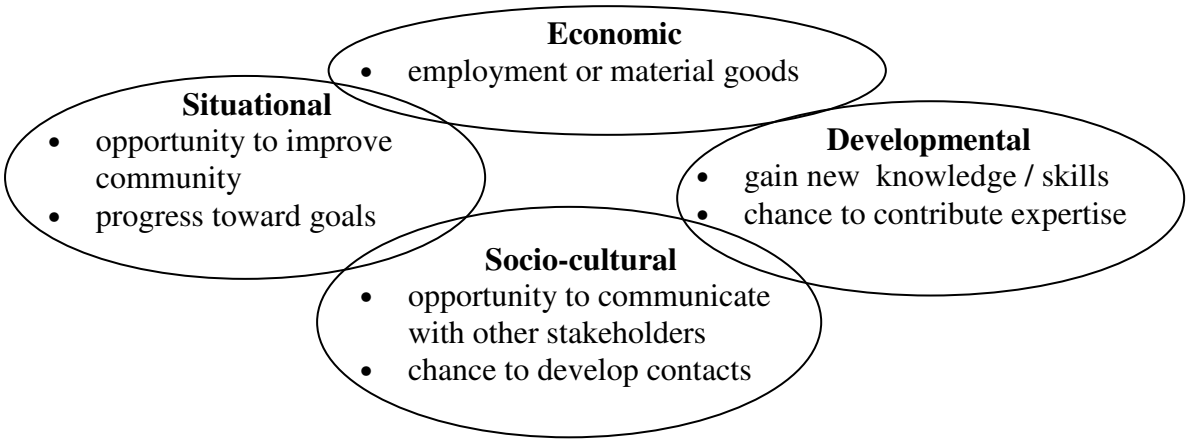

***Figure 4.4**: Economic, situational, developmental and socio-cultural incentives for local residents and NGO members.*

4.5.2 Industry

It was anticipated that some industry incentives would involve situational and socio-cultural elements, but that the majority would be primarily economic. In actual fact, companies seemed to differ widely in their approach to community issues. For example, while some industry representatives held discussions with employees or got feedback through their

union, one respondent said that their main source of information about the community was the local newspaper, and another did not make any effort to keep abreast of area issues at all. Companies that employed residents of Sobantu appeared to have situational incentives in terms of both their employees' health and the company's reputation in the staff's eyes. The following comments demonstrate both sides of the equation:

"The staff are very sensitive, they don't like it when the company is denigrated [due to bad publicity]."

"We have a number of employees who live in the area, so a positive outcome [reducing pollution in the Baynespruit] would appeal to me."

"None of our employees are affected [because they don't live in Sobantu] … if they were we might have been more aware and proactive."

One of the keys to enhancing this situational incentive is to make clear the benefits of being located next to a healthy riparian ecosystem, which many companies would consider an asset. As one municipal employee noted:

" … there seems to be an unfortunate approach by industry to regard it as a resource for disposal of refuse and waste. There's no ownership of the watercourse, they don't make use of it as a potential resource to improve the environment for themselves and their workers."

Finally, in the reverse of the disincentive posed by participatory processes that did not make progress toward their objectives, some industry representatives noted that accomplishments act as an incentive. For example:

"Enthusiasm from everybody else … an indication that it's going to be a successful venture, that it's not going to fall by the wayside [would encourage us to participate]."

The motivation for and nature of a company's participation is also important. Some industries may want to participate to make their good record known, such as one WIA company that responded positively to the idea of sharing data within a forum, saying *"we strive for transparency"*. However, other firms may want to participate to keep the status quo, and may actually work against transparency and other key aspects of a proactive participatory process (Dent, 2008). As discussed by Bansal and Roth (2000), such firms may be motivated by the threat of bad publicity, which can become an economic incentive. At a meeting of the MCMF, one consultant to the water sector responded to poor water quality data about the Baynespruit by suggesting that as legal methods had not worked *"what we really need is some toyi-toyi-ing outside the factories"*. However, good publicity can be an equally effective motivator (Triana & Ortolano, 2005), especially for companies that are already undertaking positive steps, such as one industry that said it was conducting regular

litter removal along the section of the Baynespruit it borders. The following comments, illustrate the role of publicity:

"Publicity is a factor, that the company is acknowledged [would make participation more attractive to us]."

"My role was to ensure that my company wasn't part of the problem ... They [customers] want you to be compliant, they don't want to read in the newspaper that they're associated with a polluter."

This last comment highlights the significance of pressure from corporate customers and consumers, which proved to be an important economic incentive for most industries in the WIA. In fact, one agency representative felt that such economic incentives were more effective than public pressure. Only one respondent mentioned their company having realised an economic benefit from changing their processes, in this case salvaging and re-using material, as discussed by Lober (1998) and Wheeler (1999). Many of the industry representatives interviewed made reference to their "responsibility" as a company, though; this was often in reference to standards such as ISO 14000 certification (which two companies held and a third was working toward), the chemical industry's international Responsible Care initiative, and the Department of Trade and Industry's code of good practice which is part of the Broad-Based Black Economic Empowerment (BBBEE) programme. Respondents explained how this motivated their companies:

"International suppliers normally look for ISO standards … which include air emissions, effluent, percent recycling ..."

"Some customers request our ISO 14000 certification annually …The majority of our customers … have very high standards, they come and inspect us themselves and do an audit."

"[We get pressure] through BBBEE status … Part of the BBBEE process is a social component, so at the moment we're quantifying what we should be doing in terms of social responsibility … It would include environmental issues."

"A few years ago, a major supermarket group sent letters to all the industries asking us to [prove that we] comply [with our trade effluent permit]."

While the companies surveyed did not seem motivated by competitiveness, or "actively [innovating] ecologically benign processes and products to enhance their market positions" as described by Bansal and Roth (2000: 724), they did aim to comply with corporate customers' requirements in order to maintain their market share, as found by a number of authors, such as Acutt (2003) and Buysse and Verbeke (2003). Interestingly, one of the edible oil companies claimed that they experienced no pressure from customers; the same company was the only one to allocate no resources to corporate responsibility (CR), which is

perhaps indicative of the firm's corporate culture. As an incentive, CR is often more socio-cultural in nature than economic, though it may bring financial rewards based on good publicity. As Bansal and Roth (2000: 728) note, firms "looking to do the 'right thing'" are often led by an "individual who … champion[s]" the cause. Currently, industries in the WIA who practise CR seem to focus on social causes rather than environmental initiatives, and one respondent stated that they would have to move resources away from other projects in order to fund new projects. However, there does seem to be potential to use CR as an incentive. The following comments provide a picture of the existing situation:

"We support a lot of community projects in Sobantu and Eastwood, we sponsor kids for schooling, etc. … so we do care what happens."

"We're quite involved … we sponsor food gardens, do charity - though it's more social than environmental."

"Our corporate social responsibility projects include looking after AIDS orphans, adult literacy programmes, entrepreneurial training and mentorship. We have not have been involved in environmental programmes – probably because no one ever asked."

"We're looking for projects in the community in which we can get involved."

As shown in Figure 4.5, incentives for industry were similar to barriers, with some combining elements from two categories.

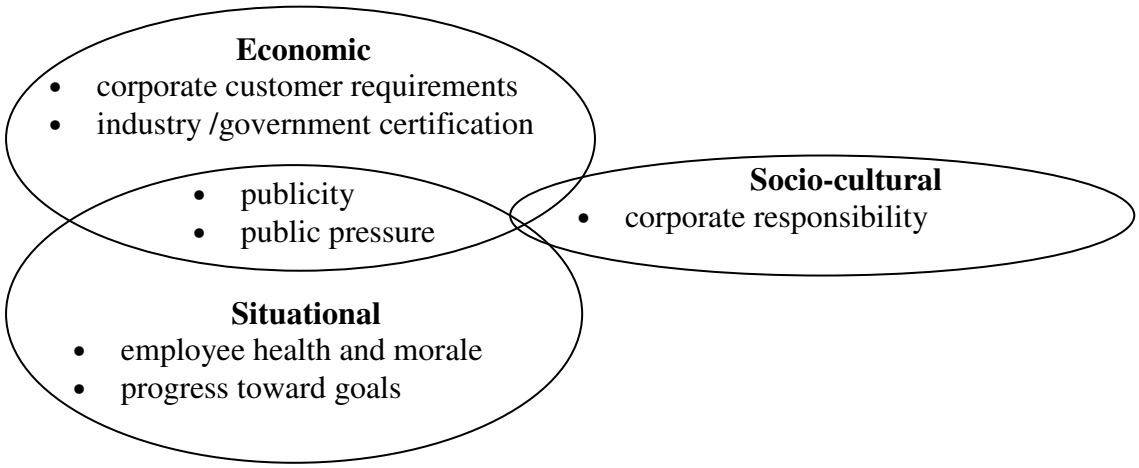

Figure 4.5: *Economic, situational and socio-cultural incentives for industry.*

On the whole, economic incentives were indeed the most important factor for industries. Situational incentives also played a role, while socio-cultural incentives were significant for some but not others. Developmental incentives did not appear to be important, but were difficult to assess.

4.5.3 Regulatory Agencies and Parastatals

For regulatory agencies and parastatals, it was expected that economic, situational, developmental and even to some degree socio-cultural incentives would affect participation. While the literature predicted that the major economic incentive to a collaborative approach would be derived from the reduction in costs associated with enforcement and litigation, this did not appear to be the case in the Baynespruit. Rather, respondents saw opportunities for increased effectiveness, and possibly cost savings, via the assistance that citizens and NGOs could provide through monitoring activities. This difference is perhaps not only a consequence of the current lack of prosecution, but also of the lack of resources mentioned by all regulatory agency and parastatal respondents, and further discussed in section 4.4.3. Comments included the following:

" … identifying drains, clearing paths, [etc., would] give people the means to observe and get information to the relevant authorities."

"[Pollution plume travel] time is about three hours from the plants [industries in the WIA] to Darvill [sewage treatment plant] … they [community members] are on site and would know sooner [if a discharge was made to both sewer and stormwater systems]."

"DUCT has been very proactive in assisting us with lobbying …[and] they're often my eyes and ears in terms of inspection."

"They [community organisations] help us focus on key areas … We can spend limited resources in a concentrated and focussed way, and achieve some success."

Nonetheless, regulatory agencies and parastatals had attempted cooperation with industry, as noted by the following responses, and hoped to be able to avoid remediation costs by reducing pollution in the first place:

"We try not to browbeat with legislation, we try to look at how it's going to benefit the company [to make improvements] … we have to find that balance."

" … we've helped industries with purification or wastewater treatment problems … We encourage waste minimisation and clean-up procedures … [we] ran a workshop with the university on techniques. It's a win-win-win for the municipality, Umgeni Water and the community [taxpayers], because it costs less [than] to clean up [a spill or a discharge of effluent]."

While it does not appear that any regulatory agencies have tried full public disclosure of environmental performance information as described by authors such as Khanna (2001), Wang *et al*. (2004) and Wheeler (1999), some are partnering with NGOs and customers to increase the political and economic pressure on polluters, as evidenced by the following comments. Unfortunately, this strategy may not be reaching all audiences: one respondent who does not make regular use of a computer had no idea that Umgeni Water's monitoring

data were publicly available, likely because it is either accessed online or circulated digitally to interested parties.

"DUCT brings that information [Umgeni Water's water quality monitoring data] to the Local Agenda 21 environmental forum … this is raising the profile of water quality in the city."

"Clearly, the voice of an organised group representing a sector of the community is much stronger than an individual's. Councillors and others will sit up and take notice."

"[Umgeni Water] requested that the retailers obtain a certificate from the supplier saying that they [industrial producers in the WIA] are compliant, [and] this has worked."

Another situational incentive found among all respondents but not mentioned in the literature was intrinsic motivation. Regulatory agency and parastatal staff were motivated to improve conditions through participation either through personal conviction or dedication to their jobs, as demonstrated by these representative comments:

" …these impacts are very serious and something needs to be done. We all need to play our part."

"As an environmentalist, I would like to see the discharges stopped."

"I want a solution to this … it's part of my job … to reduce E. coli *and ensure industry is compliant. Therefore I have to make all reasonable efforts."*

Representatives from regulatory agencies and parastatals did not seem concerned about the transparency which would likely be required, and showed no reticence to engage other stakeholders. In fact, one subject from Msunduzi Municipality and another from Umgeni Water referred to a multi-stakeholder forum as a chance to present their data and information. While they undoubtedly have economic and situational components, the support garnered for decisions taken collaboratively – as discussed by Appelstrand (2002), Carnes *et al*. (1998) and Irvin and Stansbury (2004) – is also partly a socio-cultural incentive. Respondents clearly felt that a participatory process would result in increased effectiveness:

"If they have specific targets and goals with clear objectives, these help us focus on where the community has identified specific problems and you know you've got community buy-in … they're focussed, energised [and] organised."

"… clearly dialogue is important, but you have to be advising [industry] on obligations in terms of legislation and coming up with plans that are acceptable to everyone."

"What would encourage me is having the backing from Sobantu … and having the industries there."

The incentives for regulatory agencies and parastatals are summarised in Figure 4.6.

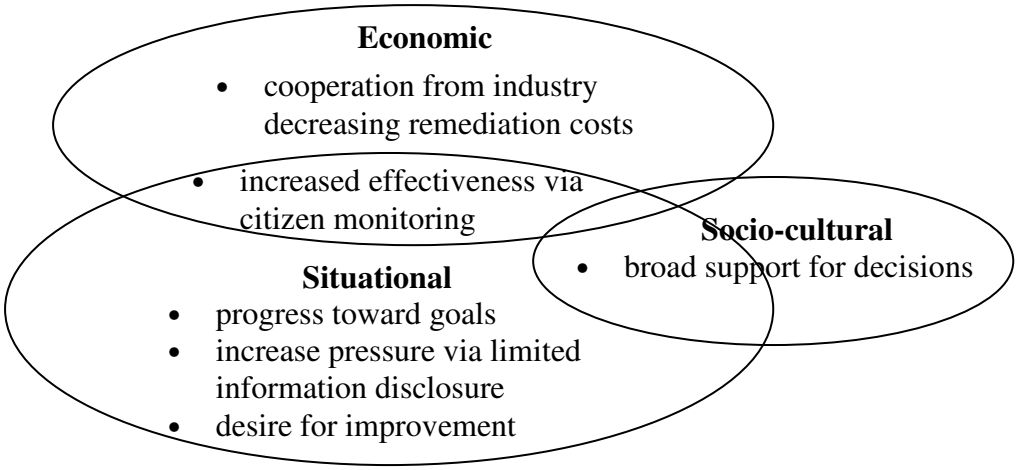

Figure 4.6*: Economic, situational and socio-cultural incentives for regulatory agencies and parastatals.*

As anticipated, mixed economic and situational incentives were important for regulatory agencies and parastatals, mostly due to the opportunities for increased effectiveness that collaboration could offer. Purely situational incentives, using limited information disclosure to attract public and political pressure, and a desire for improvement also played roles, as did the incentive of popular support for decisions, which included economic, situational and socio-cultural elements.

4.6 Summary

In this chapter, the history of pollution affecting the Baynespruit was outlined, and some of the past initiatives to address the issue were explored. Stakeholders' views of the existing problems and potential solutions, as well as the barriers and incentives to participation they face, were then examined. Some of the findings of this study conformed to expectations based on recent literature, while others did not, often due to circumstances specific to the case. In certain instances it was not possible to judge the existence or impact of an expected barrier or incentive. The central ideas described in this chapter are further explored in Chapter 5. Conclusions are drawn from the research, and recommendations are made.

Chapter 5: Conclusions and Recommendations

5.1 Introduction

The overall objective of this study was to determine how non-regulatory barriers and incentives can influence stakeholder participation in reducing water pollution in Pietermaritzburg's Baynespruit. To answer the research question, the key findings presented in the previous chapter are highlighted, the significance of these results is explored, and the actual outcomes are contrasted with expectations based on the literature. A number of conclusions are drawn with respect to the potential of non-regulatory barriers and incentives to induce or prevent successful multi-stakeholder participation in reducing water pollution in the Baynespruit, and recommendations are made for each of the stakeholders groups. In addition, changes that would have improved the methodology are recognised, and areas for possible future research are suggested.

5.2 Summary of Key Findings

This study had a number of objectives: to analyse past initiatives that have tried to address pollution in the Baynespruit; to understand stakeholders' views of the problem in terms of the major pollution issues, their effects, and perceived importance; and to identify barriers and incentives to participation in a multi-stakeholder forum, including economic, situational, developmental and socio-cultural factors. In Chapter 4, the results of the research were analysed and discussed. In the following sections, the major findings are summarised and their significance is explored.

5.2.1 History of Pollution and Remediation Efforts in the Baynespruit

Industrial effluent pollution, sewage contamination and the indiscriminate dumping of garbage has been degrading water quality in the Baynespruit for two decades. The edible oil companies in particular have a long history of intervention from authorities, both Msunduzi Municipality and the DWAF, with regard to illegal effluent discharges, but litigation has been largely ineffective. The DWAF has also taken Msunduzi Municipality to task over its failure to resolve widespread sewage contamination in local water courses, but again little has changed. Beginning in the early 1990s, sewage pollution in Pietermaritzburg's rivers and streams was being recognised as an issue requiring urgent attention. Though this appears to have resulted in some environmental education in schools, wider consultative endeavours apparently did not come to fruition. However this cannot be stated with certainty, as key players were not able to be reached during this research.

The severe pollution affecting the Baynespruit was apparently first highlighted when students and community members from Sobantu marched to City Hall in 2001 to witness SEDN96 present their grievances to the mayor and the PCCI. Shortly after this march and a further appeal to the MCMF, the Baynespruit Task Team (BTT) was established, including representation from regulatory agencies, industries in the WIA, and the community. This initiative had some temporary success in putting a stop to discharges of industrial effluent in the stream, but the pollution resumed once the BTT became inactive. One-time initiatives such as the 2001 Baynespruit Clean-up Campaign, while involving a number of stakeholders and raising awareness, have apparently not contributed to long-term solutions. One of the main problems hindering long-term progress in all these endeavours appears to have been a lack of ongoing communication and involvement among stakeholders, particularly local residents who were not kept 'in the loop' by the municipal officials and NGOs working with them. Without feedback, they would have been unable to maintain public and political pressure on the issue; it is also possible that there was fragmentation within the community's own activist networks. The BTT, which most resembled a multi-stakeholder forum, nonetheless fell short of being a participatory process due to a lack of redistribution of power which would have allowed local residents to wield some influence over decision-making. On a positive note, the increased monitoring activities undertaken by the regulatory agencies and parastatals after the formation of the BTT highlight its effectiveness as an incentive for industrial pollution reduction.

Having examined the record of pollution and remediation efforts in the Baynespruit, it is possible to see how this history contributes to the current situation. It is clear that litigation, or even the threat thereof, has become an ineffectual deterrent against not only industrial polluters but the municipality, with its woeful record on sewage. However, monitoring and increased attention seem to have worked well in reducing industrial discharges, at least temporarily. In addition, there has been a significant loss of institutional memory among government, private and civil society organisations working in the field of water issues. Finally, if the past is any indication, it will largely be up to citizens and NGOs, perhaps with some assistance from supportive agency staff members, to take the lead in raising awareness, initiating action, and sustaining attention on the issues. Local residents may well require mentoring to be able to reach the necessary level of organisation and empowerment, as well as support for their continuing efforts, given the many disappointments they have experienced in the past.

5.2.2 Stakeholders' Views of the Problem

There was general consensus among stakeholders that industrial pollution was a major problem, and most also pointed to garbage as an issue; in addition, regulatory agency and parastatal staff, as well as local residents and NGOs, felt that sewage contamination was a primary concern. All stakeholders raised the impact of pollution on human health as the greatest concern. Local residents in particular also worried about recreation and food security issues, while regulatory agency and parastatal staff tended to take a broader view of the causes of pollution and its effects on human and natural systems. Industry respondents did not seem to have an understanding of the importance of healthy riparian ecosystems as a foundation for human needs. There was a definite gradient among the stakeholder groups in terms of their level of concern: local residents were keenly aware of the loss to the community of what used to be an important resource, with the livelihoods of farmers under particular threat; regulatory agency and parastatal staff felt a commitment to working toward an improvement in the condition of the Baynespruit as part of their jobs; and most industry stakeholders felt little custodianship, despite their use of the stream for disposal of stormwater.

Local residents, frustrated by years of campaigns, media coverage, and legal action which have all failed to solve pollution problems, seemed willing to engage in a multi-stakeholder participatory process with industries, government and other interested parties. Industry respondents put a surprising amount of faith in companies in the WIA acting responsibly, given that it does not appear to have worked in the past, while also noting that monitoring and enforcement were key to reducing pollution – and placing this responsibility entirely on the authorities. Along with regulatory agency and parastatal staff, they felt that education was key to addressing the issues with local residents. Agency respondents observed that they would need more resources to carry out activities such as awareness-raising, capacity-building, better monitoring, prosecution and the replacement or repair of infrastructure in order to address the main solid and liquid pollution problems.

Gaining an appreciation of stakeholders' mental models of the Baynespruit, the pollution affecting it and the impacts of the current state of affairs contributed greatly to the understanding of possible approaches to reducing pollution. There are evidently barriers to be overcome among many industries, not only with regard to becoming informed about the pollution problems and taking responsibility for the stream (rather than just their individual stormwater outfalls), but understanding at a more basic level how healthy ecosystems underpin healthy human systems. On the other hand, agency staff members perceive themselves to be limited by budget and staff constraints, while local stakeholders are

perhaps restricting their understanding of the problems and potential solutions by not taking a wider view (beyond their community and immediately adjacent areas). All stakeholders would thus benefit from a more holistic understanding of the causes and impacts of pollution, as well as from considering the Baynespruit and indeed the uMsunduzi catchment as part of larger water systems, in order to identify the options available and the leverage points for effective intervention to bring about change.

5.2.3 Barriers to Participation

For the majority of stakeholders in all groups, economic barriers were significant in preventing them from working toward a reduction in pollution. For local residents, financial barriers included lack of funds for transport and supplies, as well as an expectation of reward for volunteer work. For the NGO representative, the main problem was lack of staff time, which, along with equipment, was also a barrier to regulatory agencies and parastatals; some respondents in the latter group also mentioned a lack of support from management. For industries, evidence from other respondents indicated that pollution reduction was often too costly to warrant the required expenditure. The costs of pollution must therefore be raised to ensure full cost accounting, for example through the instituting of a tradable permit system.

When it came to situational barriers, there was general agreement among stakeholders that a participatory process which was not proactive and cooperative, or was not making progress, would discourage participation. In addition, logistics such as the timing and location of meetings were issues raised by a number of respondents across all stakeholder groups. Given its constitutional and legislative basis in South Africa, regulatory agency and parastatal staff members had surprisingly little experience with cooperative governance. Poor cooperation among agencies, coupled with a lack of confidence in data collection and unsuccessful attempts at litigation have all created mixed situational and socio-cultural barriers to government and parastatals effectiveness. Both local residents and some industry representatives criticised the lack of monitoring and enforcement by authorities, but, with the exception of the NGO representative, they seemed unable to see how they could take action themselves to transcend this barrier. While representatives from industry responded positively to the idea of a multi-stakeholder forum, very few actually attended the Baynespruit Conservancy's first meeting, perhaps due to their low prioritisation of the issue, or a desire to avoid taking responsibility for current conditions or for making future commitments. Another barrier to polluters was the removal of potential motivating factors for change, such as the ongoing lack of enforcement by regulatory agencies, or even corruption, which was alluded to by several respondents.

Developmental barriers, in the form of a lack of skills and knowledge, were apparently restricted to local residents. Socio-cultural barriers were also greatest among local residents. A lack of empowerment, combined with learned dependency, was a major factor, though cultural elements also seemed to come into play. Residents either were not fully cognizant of the options available to them to bring pressure to bear, or were not taking full advantage of them. This was also a problem to some extent for regulatory agencies and parastatals, who could take a more creative approach to information disclosure, for example by recognising those companies that are in compliance and allowing the logical conclusions to be drawn about other firms.

Particularly for local residents, it gradually became clear that building contacts, networks and partnerships was key to overcoming many of the barriers they faced. Being 'connected' can bring, for example, knowledge of and access to funding sources, education and training resources (especially those not provided by government), as well as opportunities to build advocacy skills and become informed about the many strategies to raise awareness and bring pressure to bear. Unfortunately, residents seemed to be waiting for another stakeholder to lead this process, and it is hoped that a partnership with the DUCT will help them overcome many of the barriers they currently face. If citizens are unimpeded in taking action, this could in turn bring about the removal of some of the 'artificial' barriers holding other stakeholders back – particularly those in industry, but also in regulatory agencies and parastatals – and preventing what would otherwise be powerful incentives to reduce pollution from being effective.

5.2.4 Incentives to Participate

As with barriers to participation in pollution reduction, economic incentives played a role for all stakeholder groups. For local residents, this incentive took the form of employment or material goods. Situational elements came into play for regulatory agency and parastatal staff, for whom incentives consisted mainly of either citizen assistance with monitoring, or avoidance of remediation costs by cooperating with industry to reduce pollution. For most industry respondents, economic incentives were very important, with companies primarily motivated by corporate customers' requirements or achieving certification standards set by industry or government, such as ISO 14000 or BBBEE status. Publicity, either positive or negative, was also noted as a factor which could act as an economic incentive.

Reflecting what was found in terms of barriers, the majority of stakeholders would be encouraged to participate in a multi-stakeholder process that was achieving real progress toward its goals. The primary situational incentive for local residents and NGOs, however,

was the opportunity to contribute to bettering the community's – and their own – well-being. Interestingly, regulatory agency and parastatal staff also felt personally motivated to improve the situation, and were generally eager to share information if this could assist the process. Situational incentives for industry included employees' health (for those who live downstream) and general morale, though the importance of this incentive varied substantially among respondents.

As was the case with barriers, developmental incentives were apparently limited to local residents who wished to learn or contribute knowledge and skills. The most important incentives for this stakeholder group, though, were socio-cultural. Chief among them was the chance to communicate with other stakeholders, and potentially generate solutions together. However, an important secondary incentive, whose potential residents do not seem to have fully recognised, is the opportunity to make contacts, gain access to information and meet well-connected or influential individuals. For industry, a potential socio-cultural incentive to participate would be an appeal to those companies who practice CR, though at the moment their focus is more social than environmental.

Some incentives were evidently not playing as strong a role as they could have been. For example, the fact that regulatory agencies have largely abdicated their enforcement duties meant that avoiding the costs of prosecution was no longer an incentive. While all respondents described the role of situational incentives, the dearth of actual industry participation when the opportunity arose indicates that improving the current situation is in fact not a priority for them. However, a number of incentives were nonetheless identified among stakeholders in each category, and, along with the removal of artificial barriers, it should be possible to translate these incentives into progress.

5.3 Conclusions

Prior to beginning the research, it was predicted that each category of barriers and incentives (economic, situational, developmental and socio-cultural) would be of differing importance depending on the stakeholder group (local residents and NGOs, industry, regulatory agencies and parastatals). The literature review informed the original conceptualisation, presented in Chapter 3. While in many cases the predicted barriers and incentives were indeed present, the importance of a number of the categories deviated from what was expected for each stakeholder group, as shown in Figure 5.1. The width of each arrow represents the magnitude the corresponding category's influence.

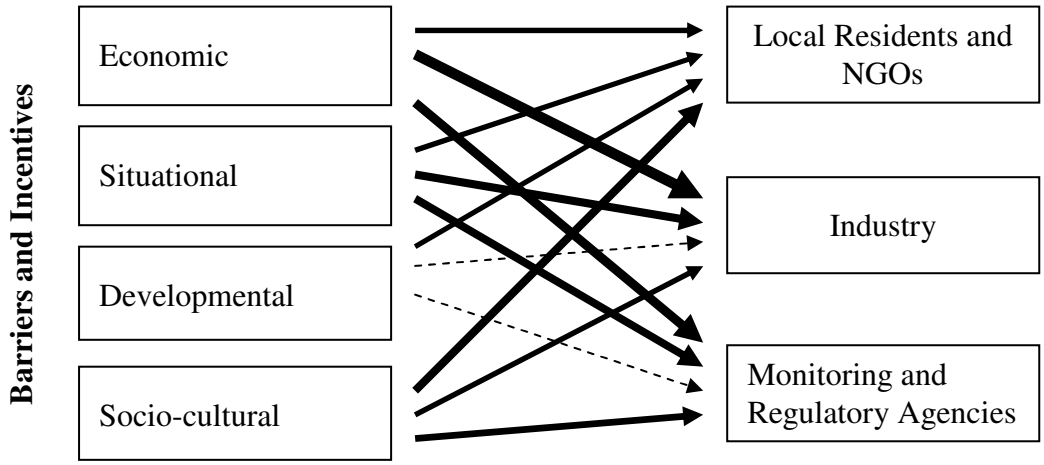

Figure 5.1*: Comparison of the relative importance of economic, situational, developmental and socio-cultural barriers and incentives.*

Based on the research conducted as part of this study, including both the review of relevant literature and the data collected from semi-structured interviews and other sources, it must be concluded that non-regulatory barriers and incentives do indeed have the potential to influence multi-stakeholder participation in reducing water pollution in the Baynespruit. However, as outlined in the preceding sections, a number of changes must be made for the incentives to be maximised and for stakeholders to be able to transcend the barriers they face and engage each other in the future. Increasing the influence of incentives and reducing the strength of barriers could include strategies such as making use of the ability of monitoring and public pressure to stimulate industrial and municipal action, as well as exploiting the potential for better coordination and more effective leveraging of power, especially on the part of community members. In addition, though developmental barriers and incentives appeared to play a role only for local residents, all stakeholders would benefit from greater information and awareness, something that should take place naturally as part of the participatory learning process. This should allow all parties to begin thinking beyond their immediate interests; some stakeholders will have farther to go in broadening their viewpoints than others.

Active participation by all stakeholders does not by itself guarantee the success of a given participatory process. Factors such as leadership and facilitation, the decision-making process (majority, consensus, etc.), stakeholder continuity, and funding support all play important roles in determining success or failure (Griffin, 1999; Irvin & Stansbury, 2004). Creating what Prestby *et al*. (1990: 144) called an 'empowering organization', which can "provide opportunities for individual participants to develop skills, gain control, and identify with others" in order to achieve the goal of pollution reduction will undoubtedly require time,

resources and effort. At the moment there is a decided lack of vision, much less a shared sense of purpose, surrounding the future of the Baynespruit: local residents picture a return to the past, regulatory agencies and parastatals want something done to clean things up, and industry seems to consider improved social conditions such as housing and service provision as the answer. However, two local residents summed up the possibilities:

"For a long time, even in a democracy, we've talked about community participation, but we're not practising it. A multi-stakeholder forum is a place where the community can represent themselves … we [all stakeholders] can generate ideas on how to solve our problems together."

" … all the stakeholders must understand each other's problems. For example, why are the factories polluting? From our side, we need to tell them how people are suffering downstream. From the municipality's side, they are ignorant of the sewerage blockage and the problems it causes for us - swimming, washing clothes ..."

"[By bringing together] the factories, the community, farmers, the municipality, Umgeni Water, the DUCT … I think it is possible … to find a lasting solution."

5.4 Recommendations

Based on the key findings of the study and the conclusions drawn, a number of recommendations may be made. With regard to each stakeholder group, the possibilities available to them to work toward the goal of participatory pollution reduction in the Baynespruit are highlighted. In addition, changes that would have improved the research methodology are made, along with suggestions for further research.

5.4.1 Local Residents and NGOs

Local residents do not appear to be taking full advantage of the potential public and political pressure they could bring to bear by developing their network of contacts. By moving beyond, for example, the local Ward Committee or partnerships developed at the municipal level, they could gain access to more powerful leverage. Local people living in Papua New Guinea's Tolukuma province, for example, most certainly did not know the administrators of a large Norwegian pension fund that held shares in the Australian company operating a gold mine in Tolukuma. However, through a satellite office of Oxfam Australia's mining ombudsman, the plight of the people whose river was being polluted by waste from the mine was made known to the Norwegians, and shortly after they pulled out, the mine pledged to clean up its act (Ferraro, 2008).

Another option that residents could use is CEM. As noted previously, CEM is often undertaken for advocacy purposes, and such tactics are already being used in South Africa. For example, air quality monitoring in South Durban and Rustenburg is coordinated through

the Pietermaritzburg-based groundWork, which is involved in the Bucket Brigades programme discussed in section 2.2.2. With respect to information release, as Meadows (1999: 13) observed, if you can not "get the powers that be to permit it to happen [you can] go around them", or in this case perhaps do it yourself.

5.4.2 Industry

With a couple of exceptions, the pollution affecting the Baynespruit was not something about which industry representatives were well-informed or even particularly concerned. While they were not against the idea of a multi-stakeholder participatory process, to date their involvement has been limited. This state of affairs is made possible because most companies do not see themselves and their stormwater outfalls as part of the larger socio-economic system of which the Baynespruit is a part. This situation may well change if and when the CMA structure is put in place regionally, and all stakeholders are forced to consider their use of and impacts on water resources. This framework will also eliminate some of the artificial barriers identified in this research, such as the lack of an enforcement threat, as discussions and decisions will take place in an open, transparent forum, rather than directly between industry and the regulatory agency – what Molle *et al*. (2008) termed the 'governance black box'. Moreover, this public focus may well result in the increased market pressure for pollution abatement measures identified by Afsah *et al*. (1997), as the links between large corporate customers and their poorly-performing suppliers are made public.

In the meantime, companies with good records could create goodwill (and likely good publicity) by participating alongside fellow stakeholders in working toward pollution reduction. Companies that still have effluent discharge problems may benefit from acknowledging them sooner rather than later, and getting technical assistance from regulatory agencies and parastatals, or undertaking an environmental audit to see where opportunities for costs savings lie in re-designing processes. In either case, industries in the WIA should consider emulating the "committed dedicated core of industrialists" (Karar & Seetal, 2000: 12) in Durban's Isipingo CMF who, over the course of 20 years of involvement, have not only considerably improved their awareness of water quality issues and the effects of pollution on human and ecological systems, but actually lead the forum's work to improve local watercourses (Cullis, 2008).

5.4.3 Regulatory Agencies and Parastatals

Staff at regulatory agencies and parastatals are aware of the causes and effects of the pollution problems along the Baynespruit. Where resources are lacking to carry out

adequate monitoring and enforcement, they could form partnerships with civil society, both to focus their resources and increase the pressure on management and elected officials to address the issues (though this latter strategy is obviously sensitive). More importantly, these agencies control the flow of information. The establishment of the Toxic Release Inventory in the United States, through which companies' reported discharges of air pollutants were made publicly available, resulted in a 40% reduction in emissions within four years; this positive 'race for the bottom' was inspired not by any legislative or economic inducements, merely by the worst polluters' desire to present a better image to the communities in which they operated (Meadows, 1999). If even this mechanism is not possible without the threat of libel, the opposite tactic of releasing positive information – for example, on those industries which are in compliance with their trade effluent permits – would nonetheless generate public scrutiny.

5.4.4 Improvements to the Methodology

A number of authors have pointed to the importance of verifying the conclusions drawn as part of qualitative research. One of the main shortcomings in this study's methodology was the representativeness of the sample of local residents: all were involved to some degree in community activism, and the majority had in fact taken on leadership roles. Thus, their thoughts and experiences are unlikely to have been representative of the community as a whole. However, they were chosen as respondents due to their ability to provide informative answers to questions which less involved residents may not have been able to address. Unfortunately, this makes it difficult to generalise the conclusions drawn to other residents of Sobantu (Monette *et al.*, 2002). In addition, as all research was conducted by a single researcher, the researcher's cultural background and point of view is likely to have influenced the analysis (Yin, 1994). Though it was not possible within the scope of this study, having other researchers analyse the data would have bolstered any common conclusions reached (Monette *et al.*, 2002). Finally, though internal validity is not a focus for case study research (Yin, 1994), Appleton (1995) suggests that a good way of checking whether the research findings from interviews are credible is to review them with key subjects; unfortunately time constraints did not allow this to occur.

5.4.5 Further Research

It is very difficult to design a case study which is considered 'complete' on its own (Yin, 1994). Indeed, two recommendations for further research have come to light over the course of this study. The first relates to the narrow boundaries within which this research was conducted. It would be informative to explore the perspectives, interests, and possible involvement of stakeholders further upstream, north of Bhambatha (formerly New Greytown)

Road, primarily in the Northdale and Raisethorpe areas; though the Baynespruit joins the uMsunduzi at Sobantu, downstream communities may also be affected. Secondly, due to the nature of this study, it was difficult to get a true picture of the barriers and incentives to industrial pollution reduction. If selected companies agreed to take part in a more in-depth study, such as the one conducted by Bansal and Roth (2000) looking at firms in the U.K. and Japan, it would no doubt generate valuable insight.

5.5 Summary

This chapter outlined how the gathering and analysis of data, complemented by a literature review, addressed the original objectives of the research. It described the key findings and their significance, and drew conclusions based on these results. It also made recommendations for each of the stakeholder groups, as well as for ways to improve the methodology and for possible further research. It is hoped that this case study, by identifying barriers and incentives to stakeholder participation, will contribute to the effectiveness of the newly-formed Baynespruit Conservancy. The Conservancy seeks to unite interested parties in reducing solid and liquid pollution in the stream and the attendant negative impacts on water quality and ecosystem health. In addition, once the CMA structure is in place regionally, local stakeholders will be instrumental in ensuring that water-related information and issues are brought to the attention of this forum, and it is hoped that this research will contribute to this process. At a broader level, it may be possible to facilitate participation by stakeholders in other areas who are experiencing similar situations or operating under similar conditions.

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Appendix A: Interview Question Guide

Introductory:

Tell me about the stream running through the Sobantu / Willowton area.

How long have you lived near / worked near / otherwise used the Baynespruit?

How is the stream part of your daily life?

What (if any) value or benefit do you derive from the Baynespruit?

Are you concerned about in its fate? Why?

Perception of Pollution Problems:

What are the main problems affecting the Baynespruit?

Which of these issues are most important to you?

How do these problems affect you and your community/employees?

How important are these impacts, for you?

How can these problems be solved?

Perception of Multi-Stakeholder Participatory Processes:

In your opinion, who needs to participate in finding solutions to these problems?

Why would you participate (or not)?

What role could you play? / How could you contribute?

What would encourage you to participate? / Why would you want to participate?

What could prevent you from participating?

What would make it easier for you to participate?

Do you think you could influence the decision-making process?

Have you participated in any past initiatives addressing the pollution in the Baynespruit?

- If so, tell me about it / them.
- What role did you play?
- What did you hope would be accomplished?
- What was actually accomplished? Why?

Have you met and/ or worked with other Baynespruit stakeholders? How did you build relationships?

How could working with them help solve the Baynespruit's pollution problems?

If you had unlimited resources, how would you solve the problem?

Please draw a map / picture of the Baynespruit area.

For Residents Only:

Are you informed about discharges? How do you feel about this?

What people or resources could assist you in participating and solving problems?

Do you think the municipality is doing all it can?

For Industry Only:

How have you faced environmental challenges over the years?

Do you allocate resources to corporate social responsibility with respect to the environment?

Do your buyers / customers put pressure on you with respect to environmental compliance?

How do you keep up with what is going on in the community?

Would you be willing to contribute data to a multi-stakeholder process?

For Agencies Only:

Have you tried multi-stakeholder processes?

What has been your experience with benefits and costs?

Have you tried working cooperatively with industry? What was your experience?

Have you tried information disclosure? What was your experience?

Appendix B: Interview Subjects

Stakeholder Group	Gender	Age	Affiliation
Local residents and NGOs	Female	18-25	Sobantu Environmental and Agricultural Forum
	Female	26-35	
	Male	36-55	
	Male	55+	
	Female	55+	
	Male	36-55	Duzi-uMngeni Conservation Trust
Industry	Female	26-35	Managers from WIA companies (Anchor Chemicals, Belgotex Carpets, Dystar Boehme Africa, Springold Investments and Willowton Oil & Cake Mills)
	Male	36-55	
	Male	36-55	
	Male	36-55	
	Male	36-55	
Regulatory agencies and parastatals	Male	26-35	Msunduzi Municipality (managers)
	Male	36-55	
	Male	55+	Msunduzi Municipality (elected official)
	Male	36-55	Umgeni Water (technical / scientific staff)
	Male	36-55	
	Female	26-35	DWAF (development staff)